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AIMS

1. *To provide a useful forum and to facilitate enjoyable contacts for all those whose special interest is the history of architecture.*
2. *To foster an appreciation and an understanding of the great buildings and architects of all historic epochs.*
3. *To encourage research in architectural history and to aid in disseminating the results of such research.*
4. *To promote the preservation of significant architectural monuments.*

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HISTORIC TOWN KEEPING

CARL FEISS

DURING THE PAST twenty-five years the scope and variety of activity to conserve historic areas has been dramatically intensified and expanded throughout the United States and its territories.

What we are discussing here is that part of the historic conservation and restoration movement that has to do with whole communities, like New Castle, Delaware, or parts of communities, like the Vieux Carré in New Orleans or Georgetown, D.C., or important or beautiful building groups such as were or still are to be found on or about our Texas or California missions, New England greens, our Pennsylvania Dutch towns, or the Virginia court-house compounds. It is my thesis that we have neglected with resulting tragic loss, the historic and architecturally supporting surroundings of our most historic and beautiful buildings, places and squares.

Important volumes have been written in the field of architectural aesthetics and theory, from Camille Sitte to Christopher Tunnard, on the value of building groups and of a supporting cast for major structures, but city by city, village by village, the national lack of sensitivity to scale and group design has done irreparable damage not only to our heritage but to the beauty of our communities. We have tended to concentrate our attention on a doorway, a cornice, or a cupola, as though a building existed in its own highly specialized vacuum. Only in a very few selected areas have we allowed our eyes to roam the full 360 degrees. Such 360-degree areas as are still remaining in New Orleans, La., Charleston, S. C., San Juan, Porto Rico, San Antonio, Texas, Georgetown, D. C., Provincetown, Mass., Herman, Mo., Natchez, Miss., or in Central Pennsylvania or New England or New York or Ohio villages, therefore, become especially precious to us.

It is not easy to take stock of activities in the 360° historic area today. They are not only varied in type and geographic distribution but they also demonstrate wide range of technical competency, historic accuracy, histrionics, and what might be called "degrees of applied emotion." From the driest of archeological "digs" to the most saccharin of our sentimental reconstructions are to be found the infinite choices which beset the historian and those of us concerned with the process of historic preservation. Somewhere in the infinite choices to be made there is a broad band of good taste, discernment, and human understanding which can be adjusted to both the scientific and romantic interests of all of us.

I want to speak feelingly for the romantic and the picturesque in our historic areas for two reasons. The first is because a fundamental part of the whole preservation movement relates to our intimate predilections for association with our past—a romantic and almost atavistic human characteristic. The second reason is simpler to define —it is that historically much of the vital growth of the United States occurred in the Romantic Period—from the Classic Revival through several phases of medievalism to Frank Lloyd Wright who has made modern architectural history with romanticism.

Let us take as an example the problem facing the National Park Service in the restoration or preservation of the Harper's Ferry Historic Site. There is no more picturesque or romantic a landscape to be found on the Eastern seaboard. The deserted and decayed village could hardly present a more tumbled and time-worn aspect. These physical features combined with the historic dramas which occurred here present the architects for restoration with the obligation not only to effect a careful and accurate renewal in accordance with selected moments from the past but also to preserve the natural beauty of the site and the buildings which age has mellowed and time has honored. The selection of the structures to be conserved is made doubly hard, as it is in nearly every community to be restored, because of the architectural variations inherent in different periods—variations which in themselves are part of the romantic aspect and history of a place but which may not coincide with the moments in history which the restoration is to commemorate.

We, therefore, must recognize from the outset the subjective and sometimes arbitrary choices to be made when dealing with restoration of communities—choices which artificial in themselves must avoid the creation of artificiality including artificial romance. But these are dangerous choices and involve great responsibility. The history of taste is a brutal and tragic road, lined with the gravestones of many cultures.

I am going to describe the various mechanical devices in use at present to finance and to organize for renewal and development control, the historic areas of which we are speaking. None of the devices listed are mutually exclusive

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or completely successful, nor am I sure that we will ever find a method or methods which will satisfy all circumstances or the highly individual responses of the trained historian or the competent amateur, let alone the general public. But the solution of any problem requires the determination of means to be adopted. By listing a number of means now currently in use, it may be possible for one to judge through familiar case histories their effectiveness and adaptability.

Since no two historic derelicts are the same, nor are the causes for senescence, decay, or neglect the same, and since the objectives of restoration are subjective and infinite, the tools to be used in repair and maintenance also are made to fit the circumstance and require inventive genius and skillful handling. But I cannot emphasize too often that the purpose, objectives, and degree of historic renewal in each case should be clearly spelled out by a plan. This plan is not only an architectural and city plan but is also a plan of development and continued or even perpetual operation and maintenance. It is a plan which must outlive the initial spurts of enthusiasm and the excitement of a treasure hunt. It must survive the generous but perhaps too personal enthusiasms of patrons and patronesses who mistake their private interests for knowledge and competency. It is a plan that must be designed to fit the seasons of the year, survive economic depressions, traffic and the honkytonks, leaky roofs and termites, and the bitter quarrels of well-intentioned zealots.

Above all it must be a plan, growing from the place itself, its meaning to you and to the place and nation, and the worthiness of the purpose for perpetual care. The subject, like the original of a portrait, must have vitality or no matter how excellent the technique or craftsmanship or cost of renewal it will be relegated to an attic. And the place should have beauty, dignity, and inspirational value or it will be also a meaningless waste of effort.

These considerations should be kept in mind in reading this list of methods now in use for the conservation and renewal of historic communities and areas. A few examples in each category illustrate each type. They do not single out either the best or the unique.

1. *Historic land and building acquisition primarily for museum purposes by federal, state, county, or municipal government for historic development.* Examples: Federal: Appomattox Court House, Virginia; Independence Hall area, Philadelphia, Pa. State: Spring Mill Park, Indiana; Columbia, California. County: The Audubon Home, Montgomery County, Pennsylvania. Municipal: Old Town in San Diego, California.

2. *Historic land and building acquisition primarily for museum purposes by private corporations, eleemosynary institutions, and historic associations.* Within this category are to be found several major types. The first is on-site museum restorations as in Williamsburg, Va., or Sunnyside, in Tarrytown, New York. The second, the creation of a new complex on a new site, as in Dearborn Village, Michigan, in Cooperstown, N. Y., or at Old Sturbridge, Mass.

Historic replacement has been practical under state auspices at Spring Mill Park, Indiana, mentioned in Category 1, and in New Salem Village, Illinois. It is a frequent and useful device to achieve appearance of authenticity on original sites while salvaging isolated old structures which might otherwise disappear or which because of their dispersed locations might be available to only a few for study and enjoyment. I know of no such similar activity for this category.

3. *Historic land and building acquisition or retention for non-museum purposes by federal, state, and local governments but with historic restoration and conservation as an objective.* Example: the renewal of the public uses of parts of San Juan Antiguo in San Juan, Porto Rico, a proposed joint enterprise of federal, commonwealth, and municipal governments with private enterprise. The New York City Hall, the restored White House, and the restoration of the Tennessee State Capitol in Nashville also fall in this category which frequently involves one major historic structure, its grounds, and occasionally adjacent or neighboring structures which are a part of the history of a place and have not outlived their usefulness. Some twenty-odd court-house compounds in Virginia fall in this category.

4. *Historic land and building acquisition or retention for non-museum purposes by eleemosynary institutions and volunteer action groups or corporations.* This category is largely limited to educational and ecclesiastical uses and frequently has as a nucleus original or early structures of the institution itself. The most publicized of such restorations is the College of William and Mary at Williamsburg, and the best known active conservation is probably at the University of Virginia at Charlottesville. Hudson Academy in Ohio is an example of an historically alert private secondary school. Those Spanish missions in Texas, Arizona, and California still in ecclesiastical use also belong in this category as do a portion of the Moravian historic area in Bethlehem, Pennsylvania, certain Mormon church properties and others.

5. *The protection of historic areas through historic districting, zoning, or other municipal regulatory measures, including tax abatement.*

Such control is frequently directed by a specially appointed group or commission with powers of recommendation or rejection. The building inspector of a locality grants building permits for new construction or modification of existing structures in a designated historic area only if such new structures or exterior alterations conform to the design judgments or aesthetic control criteria of the historic area commission. State enabling legislation providing for such historic regulatory measures exists in Maryland,

Virginia, South Carolina, North Carolina, Louisiana, Mississippi, Massachusetts, California, Texas, Porto Rico and the District of Columbia. With considerable variation of detail in the municipal ordinances, municipal historic district commissions exist in Annapolis, Md., Alexandria and Williamsburg, Va.; Charleston, South Carolina; Natchez, Miss.; New Orleans, Louisiana; Winston-Salem, North Carolina; San Juan, Porto Rico; and Washington, D.C. Pending are Boston, Mass., and Bethlehem, Penna. Enabling legislation for tax abatement for historic restoration in designated areas is unique at present to San Juan Antiguo, the old walled city in the metropolis of San Juan, Porto Rico. In some instances state enabling legislation covering historic area control is limited to one district in a designated city.

6. *A formal association of neighboring fee owners of property with historic architectural interest, for the purpose of the preservation of value their mutual interest.* Examples: Elfreth's Alley, Philadelphia; Louisburg Square, Boston. In the case of Louisburg Square, a covenant running with the land is used which is a lien on the title of all properties facing the Square.

7. *The use of federal and state urban renewal enabling legislation for the purpose of slum clearance and the rehabilitation, through private and public enterprise, of deteriorated urban areas in accordance with a renewal plan and a master plan.*

While to date the Housing Acts of 1949 and 1954 have in actuality accomplished only a small amount of rehabilitation of old structures in Philadelphia, *i.e.*, Penntown and the American Friends Service Project, this legislation holds great promise for the historic preservation movement. The first major development of plans for such preservation is that for the renewal of the historic triangle of San Juan Antiguo mentioned above. Studies for the use of the same powers for restoration of old areas are currently in process in the District of Columbia, in the Society Hill Area in Philadelphia, in Tuscon, Arizona, Nashville, Tennessee, Portland, Maine, and in the Wooster Square Area of New Haven. The last named is well under way with full local support and involves a number of striking Victorian houses. The dramatic possibilities of this new tool for area restoration and preservation have still to be understood by urban historic associations and scholars everywhere.

These categories of methods are neither all-inclusive nor clearly separate one from another. But they do indicate the wide range of organizational ingenuity generated by the historic preservation movement. I have not included in these categories the activities of any one individual or family who indulge their historic interests often to the ultimate benefit of society. We have seen many instances of fine projects undertaken by individuals, projects which have later been converted to group preservation activity—the heroine of this category of course being Miss Pamela Cunningham at Mt. Vernon. The unpredictable fact is that most of our historic restoration stems from innumerable zealous first parties who spearheaded scattered local enterprise.

There are two kinds of master plans required for the renewal of a historic area.

First in importance is the *general plan for the locality as a whole* in which the historic rehabilitation and preservation is to take place. A historic place is part of living organism in the modern world. Its restoration has educational, cultural, and emotional value. But it cannot survive in conflict with the growth of the place in which it is to be found nor can its development ignore the basic drives behind our dynamic society. A return to the womb of time is neither physically possible or psychologically healthy.

A general plan for a locality should always incorporate historic areas when they exist. The plan should designate them for special study and treatment within the corporate whole. Land uses, traffic, street plans, public improvement programs, zoning and other regulatory measures should take cognizance of the elements and requirements of historic preservation. There is no better illustration of what I mean then the general plan for Natchez, Mississippi, prepared by City Planner Arch Winter of Mobile which is complete with plans for city development from airport to historic area. San Juan, Porto Rico, New Orleans, La., and Charleston, S. Carolina, all incorporate historic areas in their plans and other cities are revising theirs bit by bit, often too late for effective control of heedless destruction.

However there are difficult decisions to be made. A local government is often faced with acute problems related to the general welfare. A hazard to the health, safety, or general welfare, no matter how ancient or how historic, may have served its time and require removal. We sentimentally drop a tear over the removal of the Third Avenue El in Manhattan, but only a silly fanatic would tie himself to a rusted pillar and defy its demolition. The requirements of flood control, water conservation, and irrigation have often necessitated the flooding of prehistoric and historic sites and communities. The lovely temple of Philae, drowned in the lake behind the Assuan Dam in Egypt is perhaps the most famous case in point. In such a case we bow to the inevitable, making careful records of what we are sacrificing.

On the other hand, much historic destruction in the name of "progress" is really in the name of "expediency" or "venality." The unwarranted destruction of Claremont Manor on the rocks above the Hudson River Drive on Manhattan and of Boscobel at Peekskill are good examples, and the recent threat to Robert Mills's Patent Office in Washington, to be replaced by a parking lot, is one of many reminders that this kind of wanton destruction is always with us. A sentimental attachment to a building or a place is seldom enough to save it from today's Vandals and Huns.

The best attack on the predators is a plan of defense and a plan of action, anticipating that no place saves itself, no matter how historic it may be.

A local planning commission may not be in the least historically minded—or it may only be giving lip service to the idea. And reliance on historic zoning only, even when it gets an occasional pat on the back from a favorable court decision, has proven wishful thinking. A historic zoning commission, while performing its appointed duties, faces not only a continuing educational responsibility to the public but in order to survive and to accomplish its objectives it must be continuously educating its brother public officials and the political forces behind them. We are looking at the practical aspects of the problem. Plans are made and are to be adopted. Land is to be acquired, public works are needed, non-conforming uses are to be eliminated, special interest groups are to be placated, real-estate investors and selfish interests of genuine hardship cases all need attention. Money, manpower, and an *operating plan*—the second kind of master plan mentioned above—are all part of the complex of city development and administration.

A clear distinction must be made here between the *general plan for the locality as a whole* and the *master project plan for historic area development*. The distinction is not so much in physical terms as it is in terms of administration and psychology. Up to the passage of the Housing Act of 1949, it was the rare city planning commission that considered the quality and condition of an area as an appropriate part of the general or master plan of a community. While the urgent efforts of special historic interests managed to establish historic zones in New Orleans, Charleston, Georgetown, D.C., San Juan, and in a few other cities, in only the last two or three years has there been an appreciable change across the nation. This has been caused, I believe, in part by the popularity of Williamsburg and other spectacular restorations, in part by the reaction to wanton destruction such as has occurred in Washington Square, New York, but mainly because cities in their desire to qualify for federal assistance under redevelopment and urban renewal legislation, must make quality judgments as well as use judgments in the preparation of a general plan and for the first time our planning commissioners are saying to each other, "Perhaps this area is worth saving, not because it has cash value but because it has a character which cannot be replaced."

When speaking of differences in scale between a general plan for a locality as a whole and for the master plan of a historic area, a distinction must be made between pockets of history to be found in a great urban region like the Philadelphia one and the smaller towns where history and geography coincide. In Philadelphia, Society Hill and Old Germantown and many other historic areas lie within several hundred urban or urbanizing square miles. We have innumerable communities in which the general plan for the locality and the master plan for historic conservation may nearly coincide—Edenton, North Carolina, Fredericksburg and Alexandria, Virginia, New Castle, Delaware, and hundreds of scattered towns and villages in Pennsylvania, Maryland, New Jersey, Ohio, New York, and New England. In either case the principle of master planning must be applied to historic areas.

Historic area planning is only an enlargement in scale and complexity of historic house programming. And one of the reasons for much of the lack of accomplishment under historic zoning has been because of a lack of a General Development Plan. Historic zoning, like much other zoning, fails when it is applied to existing conditions only, without the benefit of planned objectives, clearly mapped and in accordance with clear-cut standards of design and construction and a program for operation. It is the responsibility of the architect and planning historian to provide the general plan for both the locality and the special historic areas within the locality. These plans must belong to a program and there are no pat solutions. Each historic area is unique, from the Virgin Islands to the Klondike, or from Old San Diego to Cape Breton Isle. Sympathy with a place and planning for it are not just archeological exercises or a historian's academic hunting ground. This is no field for either the perfectionist or the eccentric, but it is the place for the kind of planning and architectural humanism that keeps tradition alive, not just a dusty waxworks museum in the center of town.

I have indicated some aspects of historic area zoning that worry me, but I know of no substitute for historic zoning except in such areas as urban renewal powers may be used. In renewal areas the renewal plan itself may provide stronger safeguards than zoning and prove a more effective instrument of policy. As a protective device, historic zoning has certainly evidenced some success in the Vieux Carré and Georgetown, for example. When financial hardship is involved even a zoning ordinance cannot prevent a property owner from destroying his premises, but it can prevent non-conforming construction or reconstruction. The judgment of the historic zone commission and whatever rules and standards they may adopt are the criteria for protection. Sometimes such criteria have reached the peak of the ridiculous. On the other hand, as we gain both experience and maturity, these minor idiosyncrasies will disappear. I am never in favor of dampening an enthusiastic and public-spirited, unpaid citizens' commission. This is where programs of education will reap a rich harvest.

As a basis for historic zoning and planning, a survey of sites and buildings is not enough. While the fact-finding survey—including mapping, photography, record search and classification, and a multitude of detailed researches—are absolutely essential, such a survey is not a plan. It is the prelude to a plan from which zoning and its administration must grow.

In cases where a historic area can be designated eligible for urban renewal, a renewal plan and renewal standards may be established and structures and areas designated as appropriate for conservation and rehabilitation. Such a program, applied for instance to areas like Society Hill in Philadelphia or the southeastern part of the Vieux Carré, provides the positive constructive mechanism not available in historic district zoning. On the other hand such a mechanism is not needed in Georgetown, D.C., where, with the exception of a few residual spots, decay has been arrested and the purely protective device of historic zoning and the vigilance of the citizenry may be all that will be needed for many years.

In deteriorating areas designated for renewal, buildings in private ownership may be designated for voluntary rehabilitation in accordance with a renewal plan or, failing this, they may be acquired by the locality for resale or rehabilitation in accordance with the plan. They may be single, scattered, or grouped structures in any combination as long as they are part of a plan approved by the planning commission and the local governing body and provided that the renewal is in accord with federal and state statutory requirements. The possibilities for historic area activity of this type are limited only by local initiative and, of course, by whether or not areas are worth rehabilitating in the first place. A place built as a slum will always be one, no matter how ancient.

Our heritage of well-designed and well-planned building groups and towns is a great one. To date almost no attention has been paid to the preservation of the integrity of the architecture and community design of such unique places as the court-house compounds of Virginia, the Hudson Valley villages of which Hudson itself is perhaps the loveliest, or of the New England greens and their surroundings. The list is a long one. In the west at Tombstone, Arizona, or Georgetown, Colorado, the word "planned" can hardly be applied, but unity of architectural character and historic interest provide a form no less appealing than the stubborn New England Georgian which was flourishing in Ohio and Indiana fifty years before these "cow towns" were born.

Of the remaining planned Utopias, New Harmony, Indiana, and Zoar, Ohio, are fine residual examples and there are of course several in Pennsylvania, New York, Utah, and other states.

It was easy to choose Appomatox Court House and Harper's Ferry for restoration. History had made the first and compelling choice. Architecturally they have much in common with many other lovely villages of their era and their geographic area. But when history has not touched such a place with her golden trumpet, when only the serenity or the charm of architecture and quality of the total community, be it a New England or Nevada village, is an arresting one, then what do we do? In some places, as in the little German village of Herman, Missouri, the townsmen are aroused. This is their place, their home, and it must remain as it was and is. Herman seems safe, for the time being at least.

The question relates to our sensitivity to architecture and the design character of the whole community. When we speak of a Cotswold or a Breton village, an Italian hill town, or a Mexican village there is a clear architectural image of a composite but fully expressed type. To some degree in some places we have achieved the same with lesser materials and within a shorter time span. But the conservation and restoration of what we have, facing the pending nuclear revolution, always is going to be a hard battle.

Then we have further contemporary architectural material to be considered—the famous Robie House battle. Frank Lloyd Wright is still very much alive, but a house of his which helped make architectural history and is of itself a beautiful thing faces extinction. It means that the architectural historian must keep his eye and his taste buds open. No man has the right to play personal hob with history. And what is true in the historic architecture of single buildings is true of the architecture of whole communities, whether they are experimental workers' communities like Pullman, Illinois, or Greenbelt, Maryland, or a Tuxedo Park or a Newport. So we face years of probing for methods, ideas, money and energy for the never-ending task of saving what is good out of the communities of the past, of what we are building today, and what we may build in the future.

Many years ago, twenty-five this summer to be exact, I was wandering through the hot olive orchards of Andalusia searching for the remains of Hadrian's city, Italica. Below the light dust of the rolling hills my feet scuffed the tesserae of forgotten mosaics, rumpled by the gnarled roots of the ancient trees. Coming abruptly to a little valley, I found below me the ancient amphitheatre, part cut into the living rocks of the hills, part built out into the valley itself. Descending the lichen-covered tiers and at a point of vantage I sat on the hot stone to watch four tired men clearing the detritus of millennia from the great stone trench which ran the full length of the center of the arena floor. It was a deep masonry channel used for flooding the amphitheatre for the mock naval combats Hadrian may have watched as a boy. Suddenly, there was a shout and the men moved out of the trench. I ran down to the edge and saw a slow stream of water well from under the dry, newly shifted stones and flow down along the scorched, paved floor. The wetness seemed to roll over the dryness—feeling its way with cautious fingers over rock and into the crannies it had not touched for nearly two thousand years. And as I walked along the edge, keeping pace with this unchained ancient stream, the whole dead world of Roman Spain came alive again and flamed for an unforgettable moment in the glare and heat of the sun.

A CRITIQUE ON THE TAJ MAHAL

CLAY LANCASTER

THE TAJ MAHAL has been admired by poets, artists, peasants, world travelers and casual American tourists; it has been showered with every epithet of praise proper to all the major languages of the world and to a goodly portion of the minor ones as well. The Taj Mahal has been found distasteful by members of all those groups and consequently derided by a comparable amount of slandering phrases. It is only natural that any object attracting so much admiration should call forth a considerable backwash of discredit also. Taste in art varies from person to person according to the experience that has befallen the individual and the conditioning he has been subjected to, and criticism is rationalization that attempts to justify what is liked and to condemn what is not. Although the object of outspoken criticism is to convert others, as often as not it leaves them indifferent or antagonized. The only tangible gain, really, is to release certain feelings on the part of the critic himself. With no more lofty aim in mind than this I set out to state my case with regard to the building that signals the high water mark of Mughal architecture.

In our century one of the severest and, at the same time, best known critics of the Taj Mahal has been Aldous Huxley, whose comments first appeared in his travel book, *Jesting Pilate*,[1] and several years ago were repeated in the deluxe Indian art magazine, *Marg*.[2] Mr. Huxley recounts his visit to the Taj—if I may be allowed this abbreviated and colloquial designation—at sunset. The choice of hour was at the advice of his guide, he said. He describes the building as "picturesque," and apparently he considers it in a class with Sezincote or the Pavilion at Brighton, the two famous examples of romantic, mock-Mughal architecture in England. Anyway, Huxley went when the sun was going down, and he speaks of the silver of the river, the rich verdancy of the gardens, the evening sounds of birds and insects, the changing colors of the sky, and the presentiment of the planets Venus and Mercury. He was impressed by everything he saw—with the exception of the building. "Nature," he says, "did its best," but "the Taj was a disappointment."

The display of expense is his first objection to the Taj Mahal. To reproduce the monument would require as much as a fifteenth to a tenth of what the Viceroy spends annually on the Indian army, he muses, as though a work of art can be reckoned in terms of what is poured down the drain each year for imperialist suppression and defense. For over 300 years the Taj has nourished men's souls, and it is to be hoped that it will continue to do so for many centuries to come, long after those of today's little brief authority have passed into oblivion.

The worst elements of the building, architecturally, Huxley opines, are the minarets, which are "unconscionably slender." He would replace the flanking shafts by four low forms, unaware that this would destroy the envelope of space created about the central mass by the tall uprights, adding so much to the three-dimensional effectiveness of the composition. He objects to the taper of the minarets, to the edging of black around each block of marble, and to the balcony bands placed "at just the wrong intervals of distance from one another and from the ground." It must be agreed that the black edgings could have been dispensed with to advantage, but the spacing of the balconies bears a logical relationship to the main building, the heights corresponding to the levels of the upper floor and roof terrace. The Taj is dull, Huxley believes, "the product not of intellectual restraint imposed on an exuberant fancy, but of an actual deficiency of fancy, a poverty of imagination." He perceives only two contrasting formal elements of design, the dome, of which the shape is reflected in the pointed portals, and the flat rectangular wall surfaces. He misses the fact that the convex domes and recessed portals are not similar but complimentary manifestations of the same motif, the sort of harmonious contrast that adds up to an interesting unity. His limited view of the monument leads him to conclude that the Taj is far inferior to contemporary buildings in Europe, citing St. Paul's in London and the Villa Rotunda near Vicenza for comparison.

St. Paul's, built a generation after the Taj, is an architectural pile made up of a large variety of component parts, including a "hemispherical dome, the great colonnaded cylinder of the drum, the flat sidewalls relieved [*sic*] by square-faced pilasters and rounded niches . . . at one end, the curved surfaces of the apse and, at the other, the West Front with its porch—a design of detached cylinders (the pillars), seen against a flat wall, and supporting yet another formal element, the triangular pediment." His description of Wren's *magnum opus* is drawn from a nostalgic memory. Crowded in among a jumble of commonplace houses,

CLAY LANCASTER, *formerly secretary-treasurer of the Society, is a free-lance writer on architecture—sometimes architectural history, at other times with a lighter touch.*

with a churchyard hardly larger than the area occupied by the edifice itself, and the square in front inadequate in size to set off to good advantage any building of its magnitude, whatever majesty the church assumes is due to its great bulk, opposing that of the insignificant structures surrounding it. With porticoes tastelessly stacked one on top of the other, one must look closely for the "detached cylinders" of which Huxley speaks. One finally sees them, like pencils in the conglomerate mass, arranged in couples across the façade, the outer ones not a column's width in front of the solid stonework of the building. One scrutinizes yet more closely for the "flat wall." It is in vain. Every surface is tattooed with rustication, pilasters and entablatures, gouged with niches and recesses, overspread with every conceivable motif of classical relief, with edicules piled on top of edicules, galleries in the air, roofs tortured into weird shapes—a veritable Hanging Gardens of Babylon in Baroque style without benefit of garden plants, a grim and grimy oversized birthday cake! St. Paul's dome is twice the height of that of the Taj, and the building being so much larger, "we should therefore expect the number of contrasting elements in its design to be greater . . ."

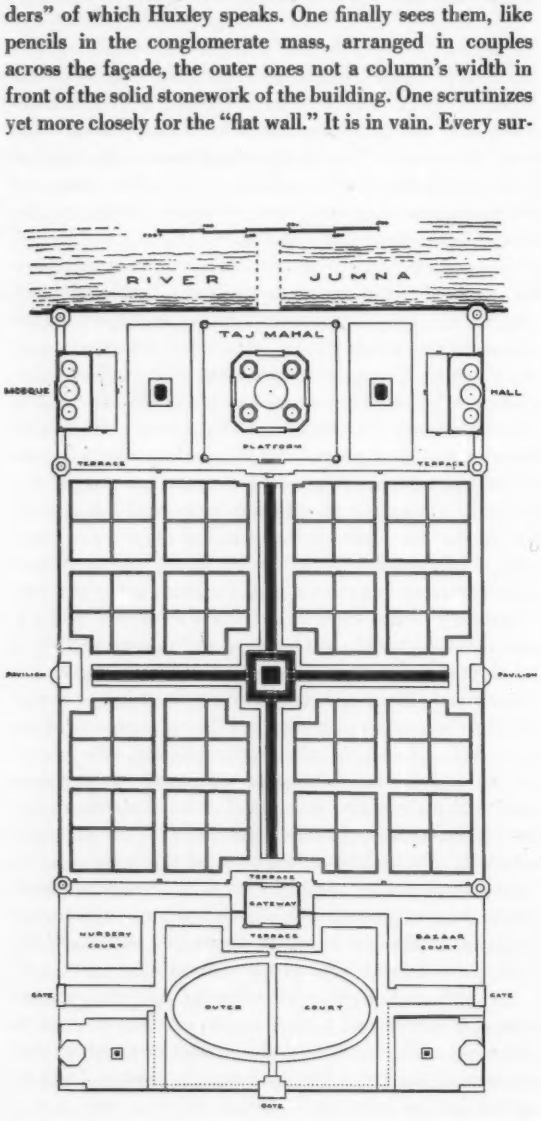

FIG. 1—Layout of the gardens and buildings of the Taj Mahal (second quarter XVII Century) near Agra: based upon Colonel Hodgson's plan of 1828. Shaded areas indicate pools.

Huxley's liking for St. Paul's goes deeper than British sentiment for the symbol of the state religion; its architecture genuinely appeals to his English taste. From this same racial norm of appreciation stems his favorable regard for the Villa Rotunda in northeast Italy as well, judging from the times the building was reproduced by wealthy Englishmen captivated by its charms: in Chiswick House, Mereworth Castle, Footscray, Nuthall Temple, and the Temple of the Four Winds at Castle Howard. In size the Rotunda is to the Taj as the latter is to St. Paul's, about half as large. Aldous Huxley perceives Palladio's sixteenth-century villa to incorporate "a far larger number of formal elements than does the Taj." He is thinking of the hexastyle Ionic porticoes (on each of the four sides, all just alike), with broad flights of steps (very un-residence-like in character) leading up to them, the pediments over windows as well as porticoes, and the dome timidly penetrating the square hipped roof. Are the elements here truly more varied than those of the Taj, or is it merely that because one has a term for each component of classic architecture that one assumes more distinction of parts than actually exists?

We need only examine the two examples. The villa is a cube with a pyramid roof truncated by a cone on top, with porticoes relieving the static form. The Taj, on the other hand, is a prism whose many sides catch the light in varying shades, intensities, and gradations due to reflections from its terraces. It is dominated by a great bulbous dome, which form is echoed by four smaller domes atop open pavilions around the base of the round central drum, and by others on subsidiary constructions. In contrast to these are the recessed portals—varying in size like the domes themselves—in each face of the building and in the façades of its dependencies. The fullness of the principal mass is accented by the attenuation of the minarets at each corner of the platform that lifts the entire structure up off the ground. It is mirrored in slightly elevated pools along the main axis of the layout, and, thus appearing inverted, the earth itself is transformed into a flat tray with thin air below as well as above it. There is no "poverty of imagination" here, if one but has eyes to perceive it.

Huxley asserts that Hindu buildings are superior to those of the Moslems, and although this is in line with his preference for complicated plasticity, one suspects that the comment was inserted partly from a desire to heap further

coals of condemnation upon the head of the Taj. There are indeed many early native architectural masterpieces in India, but to compare these with Mughal work is to compare butterflies with flowers; they are simply not of the same species of being. A Hindu building is subjective, a Moslem objective. The Hindu temple is an abode of mystery, an articulated pyramidal mass with a labyrinth of endless corridors, the very walls pullulating gods and votaries in sculptured figures; the Moslem structure is bright and open, with firm, curvilinear shapes embellished with brightly colored, flat arabesque patterns or decorative kufic inscriptions in place of anthropomorphic reliefs. Each is the embodiment of a distinct viewpoint, farther removed from one another than that of St. Paul's or the Rotunda from the Taj.

The author of the criticism detects shortcomings in the ornamentation of the Taj Mahal, in the stylized floral designs of inlaid jasper, bloodstone and agate. The observation is justified insofar as the quality of the patterns and skill of workmanship in themselves cannot measure up to those of some of the other Mughal buildings of India, notably the Tomb of I'timad-ud-Daula at Agra or Humayun's Tomb at Delhi. This last mausoleum (built some 70 years earlier than the Taj Mahal) may have served to inspire the Taj, though having not nearly so compact a form and lacking minarets, combining red sandstone with marble, and achieving its polychromed ornamentation through the *opus sectile* rather than the *pietra dura* technique, using colored opaque stone rather than luminous, semi-precious gems. It must be conceded, however, that the lucent quality of the inlay material at the Taj would call for a more delicate type of design than that of the earlier monuments, especially with a background composed entirely of high-keyed translucent marble. Can one seriously compare such exquisite substances with Palladio's stuccoed brickwork, or even with Wren's prosaic Portland stone? With regard to ornament it is to be recalled that classic architectural decoration attained its apogee in the Erechtheum at the end of the fifth century B.C. and was therefore already debased when taken over in any of the major Roman edifices; although its form was revived a millennium and a half later in the Renaissance, its spirit had long before passed beyond recall.

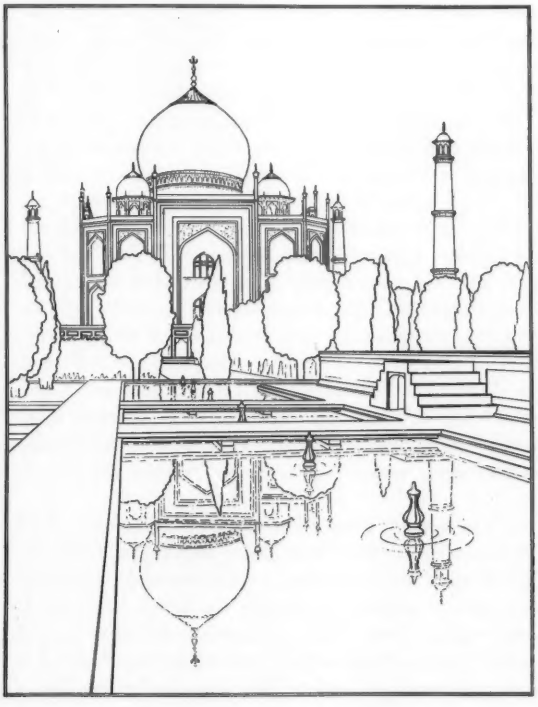

FIG. 2—The main pavilion of the Taj Mahal seen reflected in a portion of the central basin, the planting restored to what is conceived to have been its original state.

To appreciate fully the architecture of the Taj it should be viewed in the light of the Islamic building tradition. The Moslems patterned their monuments after those of the Byzantines, just as the Romans had based theirs upon the buildings of the Hellenes, only with this difference: whereas the Romans borrowed anything and everything without reservation, the Moslems took only what fitted in with their orthodox ideas, modifying the remainder in such a way so as not to oppose their dogma. The Semitic mind never conceived a religious restriction with happier effects upon art than that of the taboo against portraying natural forms, a tightening up of the old Jewish abhorrence of the graven image—perpetuated also in the Eastern Christian church—here extended by the followers of Muhammed to the exclusion of two-dimensional as well as carved representation. The Moslems made their own contributions to the magnificent manipulation of volumes developed by the Byzantines, but rejected the doleful figures of their saints, angels and gods populating the visionary Heavenly City, sitting in awesome judgment against all who entered the Christian house of worship. The directness of the Moslem faith that focuses attention upon the adoration of a single god would tolerate none of this polytheistic idolatry, and its artists set about to devise their own mode of architectural enrichment.

The conceptual change in the decoration made the difference between the ominous mood of the Byzantine church and the inviting, refreshing atmosphere of the Islamic mosque. Colorful designs developed among the minor arts were adapted to the embellishment of buildings. These designs which, for the most part constituted overall patterns

of geometric shapes and flat plant motifs in semi-abstraction, gradually developed into those elegant and graceful interlacings that we call arabesques. Here ornament remained true to its real objective, to overspread the form in such a way as to reveal, enhance and enliven it, by throwing out over its broad areas intricate networks of exquisite lines and rhythmic figures in clear and joyous hues. Following long-established indigenous techniques, in the Near East and Persia these designs were executed in glazed tiles and faience, and in India—as we have seen—in stone inlay.

As we turn our attention once more toward the Taj it is to appreciate its beauty in terms of pure design. How often the western mind has been deluded into using the orders for façade decoration in the misapprehension that engaged columns and entablatures express structure, whereas in reality these excrescences protruding from load-bearing walls add more weight than they support, and one is disturbed rather than fooled by the artifice. The Taj is innocent of such ineffectual references. It is also stainless of realistic sculptures that ill conform to elementary architectural forms, of which so much of monumental occidental architecture is guilty, where friezes and pediments are insensitively overcrowded with writhing nude bodies.[3] The impression derived from the Taj Mahal is quite different from that of traditional western buildings, whether based on earthbound ancient temples or stalagmitic-peaked medieval cathedrals. The eye is captivated by the unstrained proportions of the smooth forms and comes to rest upon the magnificent crowning dome, whose firm contour swings out beyond the line of the supporting drum, thus rendering the great round mass a buoyant and weightless spheroid suspended in the azure sky. The Taj has a bold simplicity unrealized in European structures larger than shrines.

The Taj has to be considered in relation to its setting, a walled, landscaped rectangle almost a thousand feet across and over half that again in depth, divided into a broad forecourt, the main square garden, and the terrace of the Taj proper. The accompanying layout (Fig. 1) is redrawn from a plan made in 1828 by Colonel Hodgson, Surveyor-General to India. It was made before certain changes were effected, especially in the south court, where the wide oval drive was replaced by a rectangular area and additions made to the buildings, and a general Europeanization of the planting took place in the main garden. One enters the principal enclosure from the forecourt through a large cubic gateway of polychrome stonework with turrets or attached minarets at the corners. The garden is laid out in geometric shapes by paved walks and long marble pools radiating from an elevated square tank in the center. The walks and pools are flanked by rows of trees that originally must have alternated slender cypresses or other evergreens with flowering deciduous varieties. The sixteen outlying squares are bounded by hedges, each becoming a little secluded paradise—to apply the word that we have borrowed from the Persians. One calls to mind the sparse planting seen in gardens pictured in fifteenth-century Iranian miniatures and thereby comes to understand the reason for the loose character of the *pietra dura* work on the Taj itself. The tall minarets take on new meaning when one considers how they would look glimpsed through and viewed towering above the trees and hedges that conceal much of the lower portion of the structures except from specific axial vantage points (Fig. 2). The scheme of the garden is that of an Eastern carpet on which predominant motifs are distributed along the edges and brought into relationship to one another by means of intervening figures. Often, however, the most important design is in the center, and in Mughal gardens this is usually the case. But at the Taj the principal element is at one end, which affords the building an impressive vista from the whole garden on one side and from and over the River Jumna on the other. The placing of the Taj adjacent to the river gives ostensible support to the tradition that the builder, Shah Jehan, proposed erecting a facsimile on the opposite shore, the two connected by a bridge, the duplicate perhaps built of black marble. The stream, therefore, would have become the center of the composition, a cross axis that extended far away in either direction to the remote provinces of India (Fig. 3). Tavernier, the French traveller and trader, who visited the realm during the reign of Shah Jehan, states that the emperor intended to build a tomb for himself matching that of his beloved wife—and still visible today are traces of preliminary excavations on the north bank—but war with his son put an end to Shah Jehan's proposed mausoleum, and his remains eventually were deposited alongside those of the empress Arjunand Banu Begum in the first and only Taj. The son, Aurangzeb, who obstructed his father's memorial project, built a tomb vaguely resembling the Taj Mahal for his spouse far to the south, but the design turned out considerably inferior to that of its prototype in the matter of grace and beauty. Indeed, it is so clumsy and ill conceived that this building at Aurangabad coincides much better than the jewel on the River Jumna with the rebuttals in the Huxley essay.

It is beyond my present intention to enter into any of the controversies that have been raging with regard to the Taj Mahal, other than to express an opinion that the possibility of a western architect is absurd; the design is eastern in every respect. I hope to have made this clear earlier through pointing out its fundamentally abstract nature, its freedom from references to orders that characterize traditional monumental architecture of the Occident. The rumor referred to is known to have been started by a misinformed missionary who arrived on the scene after the death of the alleged architect, actually a goldsmith, one among many of various nationalities employed by Shah Jehan to work on

the decoration of his famous peacock throne and other furnishings. If one is interested in pursuing the subject, the names of the architects, superintendents and builders, as well as other data pertinent to the erection of the building, can be found in any one of several monographs on the Taj Mahal, such as Maulvi Moin-ud-din Ahmad's *The Taj and Its Environments*,[4] and Muhammad Abdulla Chughtai's *Le Tadj Mahal d'Agra*.[5]

1. Aldous Huxley, *Jesting Pilate* (London, 1926).
2. *Marg*, Vol. IV, No. 2, pp. 15–20.
3. This lack of conformity between classic architectural design and sculpture I have analyzed in a recent review and shall not dwell upon at this time. See *The Art Bulletin*, Vol. XXXVII, No. 1 (March, 1955), pp. 74–77.
4. (Agra, *c.* 1924).
5. (Brussels, 1938).

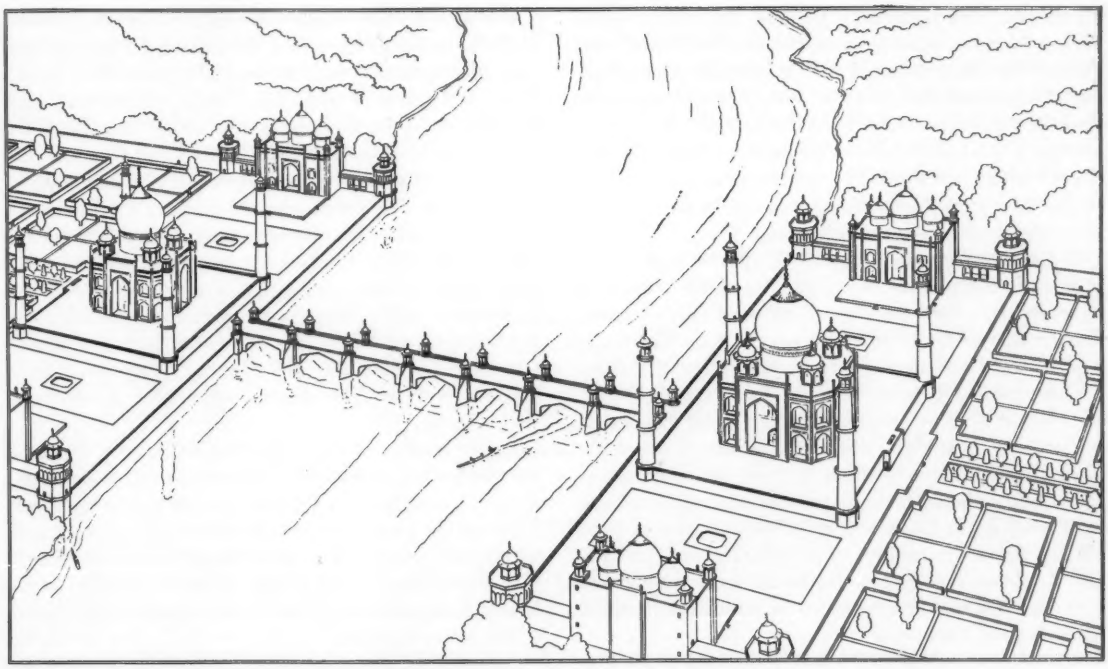

FIG. 3—Conjectural perspective sketch of the proposed scheme for the royal tombs at Agra.

BOGARDUS REVISITED

Part I: THE IRON FRONTS

TURPIN C. BANNISTER

JUST A CENTURY ago American architecture was entering a new era, its Age of Iron. Iron, the preeminent hallmark of the Industrial Revolution, had become by the middle of the nineteenth century sufficiently available and economical in the United States, either by importation or by domestic production, that its widespread use for building construction was at last practicable. Soon its strength would make possible the realization of that age-old dream, the skyscraper, but first it was to be exploited for its incombustibility and the ease with which it could be cast into almost any desired shape. These seductive qualities encouraged a state of mind which deserves the name of Ferromania.

For most historians, the prophet, apostle, and patron saint of Ferromania has been James Bogardus.[1] Now that a century has passed since he entered the American scene, it seems an appropriate time to assay more completely the man, his work, and his place in our architectural evolution.

Bogardus was born at Catskill, New York, in 1800.[2] Throughout his youth, the thriving town could offer excellent stimuli to an inquisitive mind. Fulton's *Clermont* steamed past its dock when the boy was but seven. Amos Eaton, later to found the first American engineering school, the Rensselaer Institute, was a Catskill lawyer who from 1810 on gave public lectures on scientific subjects.[3] At Catskill, Bogardus was apprenticed to the local watchmaker who trained him to become expert in the difficult crafts of engraving and die-sinking.

The prospects of Catskill, however, declined as the Erie Canal began to siphon off its back-country trade, and around 1825 Bogardus left home to try his fortune in New York City. There his industry and bent for mechanics were evidenced by a series of prizes and patents for clocks, a "ring-flyer" for cotton spinning, an eccentric sugar mill, a dry gas meter, a metal mechanical pencil, and a machine for engraving filigreed watch dials. He was firmly established by 1831 when he married Margaret, daughter of the Rev. Archibald McClay. In 1836 he went to London, apparently to promote his engraving machine. With it he engraved Queen Victoria's portrait, and in 1839 he won $2000 for applying the apparatus to the production of postage stamps. No doubt this prize financed the continental tour which he took before his return to New York in 1840.[4]

During the 1840's Bogardus sought to exploit commercially his eccentric sugar mill. He improved it and applied it to other materials, such as rice and white lead for paint. He shared a shop at 40 Eldridge Street, near Grand, and lived nearby at the corner of East Broadway and Pike.[5] His product was composed of parts made of cast iron, but, instead of casting them himself, he probably found it more economical to buy the rough castings from nearby foundries and to confine his own operations to finishing and assembly. Apparently the business prospered, since in 1848 he changed his listing in the city directory from *machinist* to *eccentric mill maker*.[6] In the previous year, his shop proving too small, Bogardus decided to erect a new factory at the eastern corner of Centre and Duane Streets, opposite several foundries which could supply him with castings (Fig. 1).[7]

By the summer of 1847 Bogardus exhibited a model of the new building which he proposed to construct entirely of iron, a material with which he was intimately familiar.[8] No doubt the great fires of 1835 and 1845 had so impressed him that he chose iron primarily for its incombustibility.[9] The foundation was laid in May, 1848,[10] and we can suppose that immediate fabrication and erection of the superstructure was intended.

Nevertheless, Bogardus soon postponed his own project to construct an iron front for the drugstore of John Milhau at 183 Broadway, between Cortlandt and Dey Streets (Fig. 2). We must assume that the internal structure employed the usual brick party walls and timber beams, but the façade, five stories high and four bays wide, was of cast iron. Its erection took only three days.[11] It featured piers with engaged Roman Doric columns at each story, spandrels with double panels enclosing applied ornaments, and fascias and a cornice frieze which sported appliquées of elliptical arch motifs. The correspondence with Bogardus' own building suggests that he used the same patterns. Indeed, he may well have delayed his own work in order to procure the patterns at a customer's expense. Assuming that the lot had a standard width of 25 feet, each of the four

TURPIN C. BANNISTER, *a founder of the Society, was the first editor of the* JOURNAL.

bays would then have been slightly more than 6 feet wide, a scale typical of Bogardus' first structures. Milhau's façade, completed in 1848, was thus the first iron front, not only of Bogardus, but of New York as well.[12] The building disappeared during the skyscraper boom soon after 1900.

Further delay arose when Edgar H. Laing ordered iron fronts for three stores to be built on his coal yard at the northwest corner of Washington and Murray Streets, in the wholesale district close to the Hudson River (Fig. 3). Work began February 25, 1849, and was finished in two months.[13] The internal structure was again composed of masonry and timber.[14] The bays of the four-story cast-iron façades repeat the design of the Milhau drugstore. We are indebted to Walter Knight Sturges for his discovery that these fronts are still standing, though they have lost most of their applied ornaments and are now disfigured by a crude modern marquee. It is of interest to note that, although only 150 tons of iron were needed, the castings were subcontracted to four different foundries: the West Point, Burden's, the Novelty Works of Stillman, Allen and Co., and William L. Miller whose furnace shared Bogardus' address at 40 Eldridge Street. [15] Bogardus' function seems to have been confined to supplying the patterns and to superintending erection.

On May 3, an item in the *Evening Post*, obviously inspired by Bogardus, extolled the advantages of cast-iron fronts "constructed . . . to secure the greatest strength with the least material . . . cast and fitted so that each piece may be put up as fast as it is brought to the ground. They may be taken down, removed, and put up again in a short time . . . nearly three feet of room is gained over buildings put up with brick. They admit more light, for the iron columns will sustain the weight that would require a wide brick wall. They combine beauty with strength, for the panels can be filled with (ornamental) figures to any extent." [16] These arguments were readily accepted; by the summer of 1849 at least eight more iron façades were under way, but apparently by other builders than Bogardus.[17] Competitive exploitation had already begun.

Soon afterward we may assume that Bogardus completed his own factory. His handsome lithographed advertisement of it amply proves that its component castings were identical with those of the Milhau and Laing façades (Fig. 4). The building provoked immediate interest, even across the

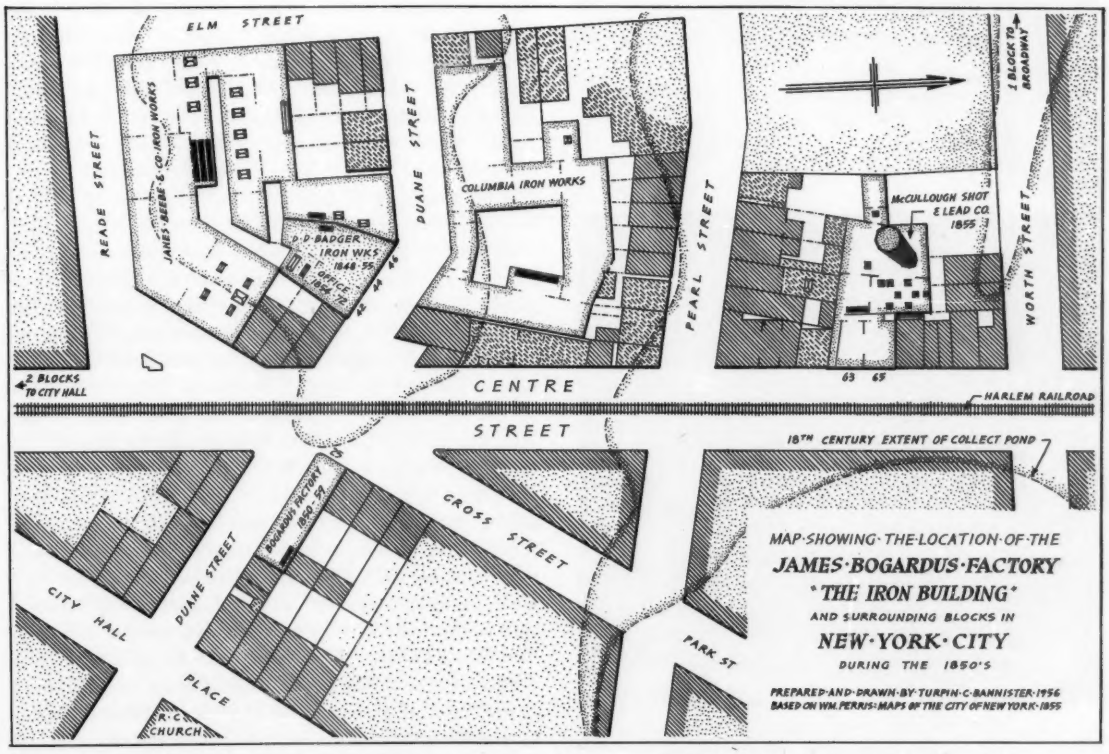

FIG. 1. New York. Map of Centre Street ironworks district, 1850's. (Bannister drawing, based on William Perris, *Maps of the City of New York*, 1st ed., 1852, III, Maps 25, 28; 3rd ed. 1857–62, I, Map 14)

FIG. 2. New York. John Milhau Drugstore, 183 Broadway (at left), 1848. (*King's Photographic Views of New York*, p. 257)

FIG. 3. New York. Edgar H. Laing Stores, northwest corner of Washington and Murray Streets, 1849. (Huson Jackson, *A Guide to New York Architecture, 1650–1952*, courtesy Reinhold Publishing Corp.)

Atlantic. On April 12, 1851, the *Illustrated London News* published a brief description and a crude woodcut of it. Unfortunately, the building stood for only a decade. In November, 1859, when Duane Street was widened, the factory was carefully dismantled in order to prove Bogardus' boast, but there is no hint that he reerected it for either his new office at 207 Canal Street or his workshop at Elm and White.[18] Perhaps the famous structure ended on the used-house market, but more probably it was melted up and recast for a later model, a final argument which Bogardus had not advanced.

Until the recovery of the Milhau and Laing stores, Bogardus' factory was thought to have been the first iron front. In recent years more thorough investigations have denied priority to all three. For, on July 27, 1847, when, according to Bogardus, his own project was only in model form, the *Cincinnati Daily Commercial* under the headline CAST IRON HOUSES reported, "We are informed, by good authority, that a block of three-story buildings are to be erected in this city [and] the entire front [is] to be of cast iron! The plates for the same are already being cast."[19] By some inscrutable editorial channel this item reappeared on September 25 in the London *Builder*.[20] Unfortunately, the location and maker of these fronts were not recorded.[21] Nevertheless, the report is entirely plausible since in the previous year, 1846, Gardner Lathrop's Cincinnati Iron Foundry had advertised iron "building fronts."[22] Moreover, Miles Greenwood later claimed that his Eagle Foundry, the largest in the West, had cast such fronts since 1843.[23] While no contemporary corroboration or executed examples have thus far been found, Greenwood's reputation for probity and his interest in fire prevention and incombustible construction make the claim highly credible.[24]

In his new factory Bogardus looked west across Centre Street to the shop of another claimant to priority in iron fronts. This was Daniel D. Badger who became his most energetic rival (Fig. 1). Born at Portsmouth, New Hampshire, in 1806, Badger learned the iron trade there and opened his own business in Boston in 1829.[25] No doubt stirred by Cyrus Alger, head of the great South Boston Iron Works, who from 1830 on promoted the idea of iron buildings, Badger erected in 1842 in Washington Street a store front with cast-iron columns and lintels which he later asserted to be the "first Iron Front in the United States."[26] A year later he bought from Arthur L. Johnson of Baltimore a patent for rolling iron shutters, a device for shop windows which required the shop front to be constructed with hollow cast-iron piers.[27] In 1846 Badger moved to New York to promote his shuttered fronts among merchants alarmed by the increasingly frequent conflagrations in the commercial district. In 1847 he established his factory at 44–46 Duane Street, possibly on the strength of a large contract to furnish shutters for A. T. Stewart's vast marble emporium on Broadway at Chambers.[28] In 1849

Badger listed himself as producing rolling shutters and iron store fronts. Bogardus did not add "cast iron houses" to his directory notice until the following year.[29] Due to the efforts of these two men Centre Street henceforth dominated the career of the American iron front.

Apparently Badger in his claim of priority chose to disregard the difference between his single-story shop fronts and Bogardus' whole façades, but in any case his Boston shop front was hardly a novelty in 1842. Alexander Jackson Davis had built one in 1835 for New York's Lyceum of Natural History, on Broadway between Prince and Spring, in order to reduce the usual heavy masonry piers and obtain larger display windows.[30] Davis was probably inspired by François Thiollet's 1832 publication of Parisian examples.[31]

There was still another predecessor building to which Bogardus was almost certainly indebted. In the summer of 1839 William Fairbairn, the famous British iron master, visited Constantinople to advise the Turkish government on the modernization of its arsenals, docks, and industries. This led to an order for Fairbairn to supply a steam flour mill for the army.[32] To house the machinery, Fairbairn prefabricated in his shops at Millwall, London, a three-story iron building, 27 by 50 feet (Fig. 5). The framework was entirely of cast iron; the lower spandrels were of the same material, while those above were of wrought iron. The roof was of corrugated iron sheets. Cast-iron beams and columns carried the floors and roof. Only the foundations and a low interior wall supporting the machinery were of masonry.[33] Before being shipped to Constantinople in 1840, the assembled structure was exhibited to the public at Millwall. It is entirely probable that Bogardus personally inspected this extraordinary structure before his return to New York, but, even if he did not, he could hardly have escaped during the next several years the ample accounts of it reported by the popular and technical press. In 1842–43 British progress in iron buildings had been promptly noted by newspapers in both New York and Cincinnati.[34]

The first American iron façade had preceded Bogardus by exactly two decades. In 1828 the Pennsylvania frontier coal-mining village of Pottsville celebrated its incorporation as a borough by inaugurating its first financial institution, the Miners' Bank.[35] When an appropriate building was constructed in 1829–30, two of the directors who were residents of Philadelphia secured the architectural services of John Haviland of that city. Following current Philadelphian models, Haviland designed a small structure with walls and vaults of brick. For the two-story façade, however, he intended decorative ashlar, but, finding no suitable local quarry, he substituted cast-iron plates which, when painted and sanded, produced the "very beautiful and uniform texture of stone" (Fig. 6).[36] This solution was probably prompted in part by the fact that another director, Benjamin Pott, was the son of John Pott, promoter of

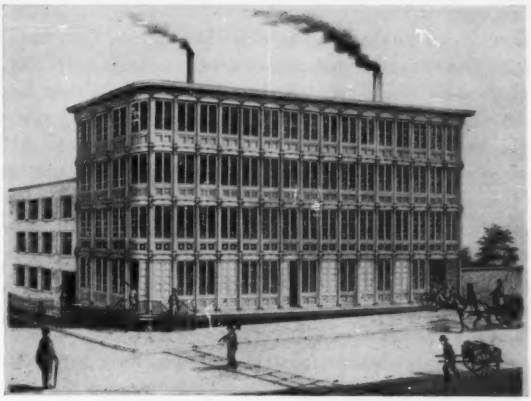

FIG. 4. New York. Bogardus Factory, the *Iron Building*, Centre and Duane Streets, 1848–49. (Ackerman lithograph, courtesy of the Museum of the City of New York)

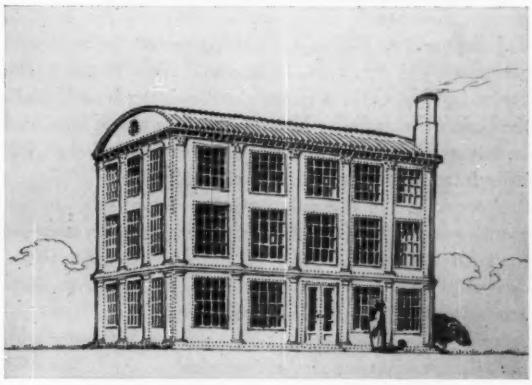

FIG. 5. Constantinople. Iron Flour Mill, 1839–41. (Bannister reconstruction)

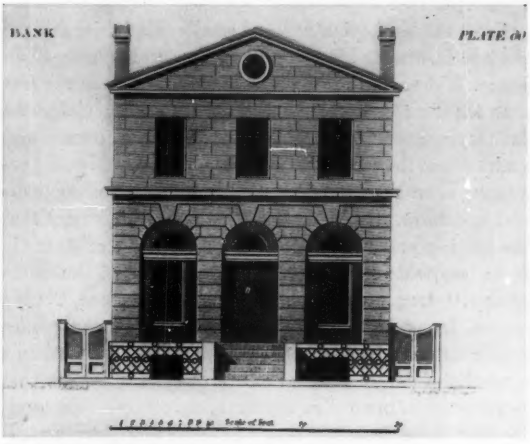

FIG. 6. Pottsville, Pennsylvania. Miners' Bank, 1829–30. Elevation. (John Haviland, *An Improved and Enlarged Edition of Biddle's Young Carpenter's Assistant*, Plate 60)

the town and owner since 1807 of the local Greenwood Foundry which doubtless supplied the castings.[37] But Haviland also surely knew of similar uses of metallic veneering. He had no doubt seen the iron-faced Narva Triumphal Arch at St. Petersburg, Russia, just completed by Quarenghi and Staroff when he visited that city in 1816.[38] Moreover, the bronze-revetted Vendome Column built by Napoleon at Paris in 1806–10 had attracted wide attention among architects. Haviland may also have read of the recent Parisian vogue for cast-iron shop fronts.[39] In any case, the bank and its façade were widely reported and no doubt stirred the imagination of both Alger and Badger in Boston and Bogardus in New York.[40]

While Bogardus was thus in no sense the inventor of the iron front, his work appeared at a moment when the state of technology, need, and taste combined to favor its acceptance and exploitation. The earliest example of this reaction outside New York was the Penn Mutual Life Insurance Company's Office, erected between April, 1850, and September, 1851, in Philadelphia at the northeast corner of Third and Dock Streets.[41] Next to the Laing Stores in New York, it is the oldest existing iron front in the United States. Its architect, G. P. Cummings, furnished an astylar design with wide piers and small windows originally intended for execution in masonry. News of Bogardus' work led to the substitution of iron, but, though purchase of a Bogardus front was considered, a contract for local castings was finally let. Inexperience led to delay, especially when the Third Street side, discovered to overreach the lot line by three inches, had to be taken down and refitted.[42] The resulting building contrasts markedly with the lightness and openness of Bogardus' products. It would be interesting to know what Haviland, still living at the time, thought of this mid-century revival of his idea of two decades earlier.

From modest beginnings and small-scale initial designs the iron front soon blossomed into large and luscious effulgence. Widespread acceptance came in part from the fact that the first examples and the enthusiastic claims of foundrymen now convinced previously hesitant owners and architects of the safety and economy of iron.[43] Metallic veneering soon became fashionable, especially for commercial structures. Bogardus pressed home his argument that the casting process at last made the richest aristocratic styles available within the limited budgets of the bourgeoisie.[44] Iron thus joined Walpole's cast stone, Nash's stucco, Inwood's terra cotta, and the ubiquitous *papier mâché* as one of those characteristic substitute materials symbolic of the nineteenth century's yearning for low-cost *haute couture*. In no other age has architectural respectability been more fervently sought. Only a few purists challenged the emulation of eclectic and masonry forms in iron, and even fewer seemed to appreciate its potentialities of litheness and openness.[45] Paxton's Crystal Palace and its progeny quickly subsided before the taste for traditional effects. To Bogardus, Badger, and their rapidly multiplying competitors the iron front was primarily an opportunity for business exploitation. They swam with the current of dominant desire and, on the whole, found it profitable and easy exercise.

Bogardus had just occupied his new factory when in April, 1850, he associated with Hamilton Hoppin to win his first out-of-town contract to erect the large iron front of the Sun Building in Baltimore. No doubt the owner, A. S. Abell, had decided to use metal on the recommendation of his New York architect, R. G. Hatfield.[46] Badger supplied either rolling shutters or some of the castings.[47] The building was occupied in September, 1851. Except for similar bay widths, Hatfield's design differed decidedly from Bogardus' earlier fronts (Fig. 7). The ground story, occupied by shops, presented segmentally arched bays separated by deep, narrow, panelled iron piers over which a thin projecting fascia was supported by console brackets. This astylar treatment formed a curiously weak base for the vigorous display above. The four upper stories were given gradually diminishing heights and were grouped visually into two double stages by the introduction of arched windows in the third and fifth levels. The piers received strong emphasis through the use of three superimposed orders, each slenderized by projecting pedestal and entablature blocks. The verticals ended in the top story with statues above which large consoles jutted to carry the massive crowning cornice. Thus, the full panoply of the then novel Baroque vocabulary was recruited to obtain a surprisingly vertical accent paralleling contemporary Gothic treatments such as had been used in the Jayne façade in Philadelphia. In the lush Sun design Hatfield established a prototype which was to be much admired and followed in the next two decades.

Cast-iron architecture received a powerful stimulus early in 1852 when Thomas Ustick Walter chose it for rebuilding the new Library of Congress within the U. S. Capitol itself.[48] It is interesting to note that of the eight bids submitted for the work seven came from New York State. Bogardus and Hoppin were among these, but lost the contract to their Centre Street neighbors, Janes, Beebe and Co., who during the next decade went on to furnish 4,454 tons of castings for the Capitol dome as well (Fig. 1).[49]

Perhaps Bogardus' best known iron façade was that erected in 1854 for the Harper Brothers Printing Plant facing Franklin Square in New York (Fig. 8).[50] The building replaced one lost in a disastrous fire. John B. Corlies, the architect and builder, designed the new plant to secure maximum safety against fire and also to reduce construction time to the minimum. The cast-iron front met both of these conditions, and to cut its fabrication schedule still further, Bogardus had the castings of the four upper stories made from the patterns of Hatfield's Sun Building in Balti-

more. For the ground story, however, a stronger treatment, with elegant Corinthian columns and entablature, was substituted. Luckily, the 6½-foot width of the twenty bays of the 130-foot front meshed neatly with the internal structural system which Corlies determined.

Although Hatfield's approval to duplicate the Sun Building design was doubtless procured, the case raises an interesting professional problem. Since working drawings for a commission remain the property of the architect as "instruments of service," did iron architecture make it necessary for him to control the patterns as well? The possibility of similar duplication in other cases also emphasizes the need for caution in attributing the design of an iron front to a specific architect.

In 1858 Bogardus published an advertising pamphlet written for him by John W. Thomson, a teacher, and entitled *Cast Iron Buildings, their construction and advantages*. The text sums up all of his previous arguments and in addition lists more than 30 executed projects constituting a considerable accomplishment over the preceding decade. About half were located in New York and it is notable that Bogardus had already supplied fronts not only to clients in Philadelphia, Baltimore, and Washington, but also as far afield as Chicago, San Francisco, and Havana.[51] The Cuban commission was a tremendous warehouse for the Santa Catalina Company, 400 by 600 feet, and 50 feet high. It was reported in October, 1859, that it would still require two years to complete the contract.[52]

No doubt Bogardus' pamphlet was a natural reaction to the cessation of building in the 1857 panic and to the growing rivalry furnished by the increasingly successful Daniel Badger. In 1852, or soon after, Badger had employed, as manager of his new architectural department, a young and energetic English builder, George H. Johnson, who was later to play an important role in the development of terra cotta fireproofing for iron buildings.[53] By 1855 Badger's business required expanded production facilities which he obtained on East 14th Street between Avenue C and the East River. During the next year he incorporated his firm as the Architectural Iron Works of New York.[54] In 1857 he erected the monumental five-story façades of the E. V. Haughwout and Company's Store which still stands serenely on the northeast corner of Broadway and Broome Street (Fig. 9).[55] J. P. Gaynor, the architect, skillfully quoted Palladio in the bay motif of a window arch on a small order between piers with engaged Corinthian columns. Each story is separated by strong entablature and pedestal bands and the whole is crowned by a handsomely bold entablature. With its original light stone-tinted paint creating rich patterns of transparent shadows, it must have been one of the finest examples of the Renaissance Revival.

Iron front construction, for all of its novelty and economy, was actually a rather simple problem for firms skilled in making complex machinery. Before long, foundries throughout the country rushed to supply the growing market.[56] In New York, the Cornell, James L. Jackson, Excelsior (George R. Jackson), and Aetna Iron Works soon came to be very active in the field.[57] John B. Cornell, for example, erected in 1859–60 the largest and best known of all iron fronts, the A. T. Stewart Store (later Wanamaker's) on Broadway between Ninth and Tenth Streets for which John Kellum was the architect. Stewart proudly likened its four white-painted Renaissance façades, 85 feet high and 961 feet long, to "puffs of clouds."[58] By December, 1854, even the Pacific Foundry of San Francisco was advertising its building fronts.[59] Increasing interest likewise provoked a number of patents for iron construction.[60] However, none of those granted by 1860 was particularly significant; some were ingenious but impractical; others were obviously inspired by the desire of newcomers to obtain competitive advantage from the legal recognition implied.

It is beyond our scope to trace in detail the subsequent course of Ferromania. During the Civil War, even the North's need for munitions caused little curtailment. Indeed, President Lincoln ordered work on the Capitol dome to continue as a morale-building precaution.[61] When peace finally came, a building boom of record proportions loomed. Though the iron front was by then an accepted type of construction, Bogardus, now approaching the age of seventy, no longer was to be its presiding genius. Leadership passed to Badger and his Architectural Iron Works. In 1865 Badger issued a handsome catalog which listed 604 executed projects, of which 549 were single-story store fronts and 55 were façades of from two to six stories.[62] There had been erected in New York and Brooklyn 383 of the store fronts and 36 of the façades. The catalog illustrates many designs of excellent quality, perhaps because so many of them had been furnished by competent architects.[63]

The last great wave of iron fronts in New York came in the 1880's with the conversion of Mercer and Greene Streets, from Canal north to Houston, to serve as the city's principal wholesale dry goods district.[64] Block after block of towering lofts transformed quiet residential streets into metallic canyons. They add measurably to New York's remaining iron frontage which in 1943 still totalled, south of 14th Street, an impressive 2.75 miles.[65] Not until around 1890 did the fashion subside before more stringent building codes, the urge for greater height, and the new taste for Richardson's masonic Romanesque.

Thus, from the standpoint of the iron front alone, it appears that Bogardus, whatever he contributed to its popularization, most certainly did not invent, initiate, or monopolize it. While it cannot be proved that he knew of Haviland's or Fairbairn's work, it is very difficult to believe that he did not, because all the permissive factors suggest that he did. If he had claimed its invention while

knowing the Pottsville bank and the Turkish flour mill, it would be difficult to acquit him of deliberate misrepresentation.

But did he make such a claim? The truth is that he did not. Actually, in his fullest advertisements, he described himself as "Architect in Iron; originator, constructor, and patentee of iron buildings; and manufacturer of the eccentric mill." It is interesting to note that this phrasing with the keyword "originator" appeared for the first time in the city directory of 1858, perhaps in response to Badger's growing competition and counterclaim. Although the same statements recurred in a series of notices in the *Architects' and Mechanics' Journal* during the following year, the word "originator" was henceforth absent from subsequent directories until it was repeated in 1872 and 1873, the last two editions before his death on April 13, 1874.[66] Before 1858 he was content to confine his title to "machinist," or "eccentric mill maker," or "iron manufacturer," or "manufacturer of cast iron houses," or "Architect in Iron; constructor and patentee of Iron Buildings." [67]

FIG. 7. Baltimore. Sun Building, 1851. (Courtesy of the Enoch Pratt Free Library)

FIG. 8. New York. Harper and Brothers' Printing House, Franklin Square façade, 1854. (Brown Brothers)

Therefore it is clear that Bogardus never considered the iron front itself as more than a lucrative commercial product. On the other hand, his use of the term "Iron *Buildings*" indicated his interest in them as complete units, rather than in just their façades. But he did not even claim *iron buildings* as an invention in his patent, No. 7337, dated May 7, 1850; it was simply entitled "Construction of the Frame, Roof, and Floor of Iron Buildings" (Fig. 10). Drawn up as he was still finishing his own factory, it shows (upper left) a two-story version of the identical design he had used for Milhau, Laing, and himself, except that all applied ornament is omitted. The floor beams, seen in the sections, have interest in that each has a wrought-iron rod inserted in the lower ends of a cast-iron arch, forming a sort of trussed arch. Since wrought iron is markedly higher in tensile strength than cast iron, these beams saved considerable metal. Bogardus did not claim this as his own idea; indeed he could not, for John Gardner, a Berkshire engineer, had patented it in Britain in December, 1848, and had published it in the *Civil Engineers' and Architects' Journal* in 1849.[68] The resemblance between the two is striking.

Actually Bogardus claimed only three innovations. First, his method of bolting columns and girders through end flanges. Second, the tongue-and-groove jointing of his flooring sheets. And, third, the interlapping of his roofing plates. None of these was at all revolutionary or even important. Thus, the patent itself does nothing to bolster any pretension to great original contributions.

Moreover, it is significant that Bogardus, in his 1858 pamphlet, made only passing minor references to these innovations. He claimed special virtue for his bolted connections as overcoming vibration and expansion hazards. The flooring sheets would not permit fire to spread to other stories.[69] In contrast to these very general arguments, he stressed that the trussed arch principle, which he did not claim as his own, had been adopted by Corlies for the Harper Printing Plant. Here, however, the casting was greatly elaborated by complex ornamentation.[70] Apparently these trussed-arch girders aroused some general interest since, as soon as the Harper plant was completed, the New York Wire Railing Works was already picturing both plain and fancy versions in its catalog.[71] In any case, the joists supported on these Harper girders explain why trussed arches

had no lasting significance, for these joists were rolled wrought-iron sections, 7 inches deep, developed by Abram Hewitt at Cooper and Hewitt's Trenton Iron Works and the first American examples of sufficient size to satisfy the requirements of building spans.[72] They, rather than the trussed arches, were prophetic of the floor systems of future skyscrapers.

If we assume that Bogardus constructed his factory according to his patent drawings, it becomes clear that it would be his use of iron for the whole ensemble—walls, floors, roof, and partitions—on which he must rest his claim as "originator of iron buildings." Stated in such terms, Haviland and his iron veneer would obviously be eliminated. Badger likewise could not compete because he claimed to have built only an iron store front in 1842. Bogardus probably would not have considered William Strickland's iron market house, erected in Philadelphia in 1834, as satisfying his definition since it had only a single story and therefore no iron floors.[73] He would have the same objection to the one-story sheet-iron prefabs which Britain had exported so diligently throughout the '40's. Thus, for him, Fairbairn would be the closest contender since his Turkish flour mill had iron walls, roof, and floor beams. But Fairbairn needed no partitions and the published sections of his mill show floor panels between the beams too thick to look like iron.[74] Unfortunately, Fairbairn did not describe these panels and, despite his statement that only the supporting pier of the machinery was of masonry, there remains the possibility that he formed the panels of segmental arches in brick or on some other non-metallic system. If indeed this was the case, Bogardus' claim would then be vindicated, but only by a few floor plates. It could hardly rest on slenderer grounds.

This conclusion is predicated on the assumption that Bogardus built his factory in conformity with his patent specification of an "iron building." In his 1858 pamphlet he called the structure "the first complete cast-iron building in America and in the world," but it is curious that, while he discoursed at some length on the details of the exterior walls, he remained singularly inexplicit about its internal construction. The suspicion that it perhaps was not as "complete" as he would have us believe is certainly not allayed by the *New York Sun's* report of its dismantling in 1859: "his building has been taken down piece by piece, even to the ornaments and *timbers*." [75] It is difficult to understand what role "timbers" could legitimately play in the world's "first complete iron building"! Perhaps the most charitable view we can take is that Bogardus desired to erect his factory wholly of iron, but, for some reason falling short of his goal, preferred for promotional purposes to present it as fulfilling the ideal exemplified in the patent which followed its completion by several months. If this argument seems excessively legalistic, we must remember that Bogardus was an enthusiastic promoter and a very shrewd business man primarily concerned with selling his product in an extremely competitive mid-nineteenth century market. To him the desire of mid-twentieth century historians for a precise and complete record would probably seem a droll and irrelevant sport. Nevertheless the final irony is that no later building built by him according to his patent specification has thus far come to light.

It is clear that the reputation heretofore accorded Bogardus has arisen almost exclusively from the attribution

FIG. 9. New York. E. V. Haughwout and Company Store, 488–492 Broadway, at Broome Street, 1857. (Courtesy of the Otis Elevator Company)

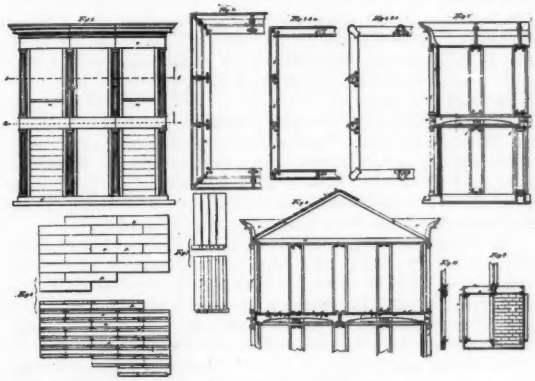

FIG. 10. Patent No. 7337, by James Bogardus, 1850. Drawings.

to him of a creative role in the evolution of the cast-iron front. Closer study of the record reveals that this estimate has been based on a too-uncritical acceptance of claims he made in the heat of commercial rivalry. It is now apparent that, while his energetic part in popularizing iron fronts is demonstrable, his pretensions to innovating them must be evaluated in context and drawn from more than a self-laudatory advertising pamphlet. If this was his total contribution to American architecture, the importance previously bestowed upon him must be radically reduced. But this was not the case, for in several works only recently recognized it can be shown that, perhaps inadvertently and without realizing their eventual significance, Bogardus achieved results which justify for him an honorable, if unsuspected, place in the main stream of architectural history. Part II of this study will present the evidence on which this well-deserved rehabilitation can be based.

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(*Part II:* The Iron Towers *will appear in an early issue.*)

1. A particularly adulatory account is contained in Sigfried Giedion, *Space, Time and Architecture* (Cambridge, Mass., 1941), pp. 129–134; a preliminary account is contained in Turpin C. Bannister, "Some Early Iron Buildings in New York," *New York History*, Vol. 24, No. 4 (October, 1943), pp. 518–24.

2. *Dictionary of American Biography*, "James Bogardus" by Carl W. Mitman, which was based principally upon obituaries in the *New York Herald* (April 14, 1874) and the *Scientific American* (May 2, 1874).

3. Palmer C. Ricketts, *Amos Eaton, Author, Teacher, Investigator* (Rensselaer Polytechnic Institute, Engineering and Science Series, No. 45 [Troy, 1933]), p. 9; H. S. Van Klooster, *Amos Eaton as a Chemist* (R.P.I., Eng. and Sci. Ser., No. 56 [Troy, 1938]), p. 5.

4. *DAB, loc. cit.*

5. *Doggett's New York City Directory, 1847–48.* In 1845 his shop was at 87 Eldridge.

6. *Ibid.*, 1848–49.

7. Bogardus always gave his address as "Centre, corner of Duane." Fig. 1, based on William Perris, *Maps of the City of New York* (1st ed.; 1852), Vol. 3, Maps 25, 28; (3rd ed., 1857–62), Vol. 1, Map 14, shows that only the eastern corner provided a plot conforming to later views of the factory. Moreover, the indication on the Perris maps of a boiler (shown as a black rectangle) and a hazardous occupancy—not present on the other three corners—proves its use for industrial purposes. Bogardus no doubt preferred the general address to the more exact 25 Cross Street, which, being only one block long, would be less well known. Curiously, both the first and third editions of the Perris maps show the factory as of brick ("Second Class") construction, but iron fronts were still too new to merit the separate classification they later received. The Milhau drugstore at 183 Broadway and the Tatham Works at 82–84 Beekman Street likewise appeared as brick buildings. The whole neighborhood represented in Fig. 1 disappeared in the 1920's with the creation of Foley Square.

8. James Bogardus, *Cast Iron Buildings, their construction and advantages* (New York, 1858).

9. The "Great Fire" of December 16–17, 1835, destroyed nearly 700 buildings in the seventeen blocks between Wall and Broad Streets and the East River. On July 19, 1845, more than 300 buildings in the same area burned (I. N. Phelps Stokes, *New York Past and Present* [New York, 1939], pp. 78–79).

10. Bogardus, *op. cit.*

11. *Moses King's Handbook of New York City* (Boston, 1892), pp. 806–7; *Moses King's Photographic Views of New York* (Boston, 1895), pp. 256–7; I. N. Phelps Stokes, *The Iconography of Manhattan Island* (New York, 1915–28), III, 883, Pl. 24A, b (1856 lithograph by W. Stephenson of the west side of Broadway, between Cortlandt and Fulton Streets, including the Milhau front).

12. The date of 1848 is established by a Milhau letterhead reproduced in *King's Photographic Views* (p. 256), and by Milhau's location at 183 Broadway in that year (*Doggett's New York City Directory, 1848–49*). Bogardus, *op. cit.*, lists Milhau as a customer. Reference to the priority of the Milhau front is given in Henry Ericsson, *Sixty Years a Builder* (Chicago, 1942), p. 152.

13. *History of Architecture and the Building Trades of Greater New York* (New York, 1899), II, 168–170, quoting *New York Evening Post*, May 3, 1849, in which the name is given as *Lang. Doggett's New York City Directory, 1846–47* lists Edgar H. Laing and Co. with coal yards also at 61 Leonard, 13th and Hudson, and 21st and Ninth Avenue.

14. Huson Jackson, *A guide to New York Architecture, 1650–1952* (New York, 1952), p. 7. In 1954 the ground floor of 258 Washington Street was occupied by the Tom Tramutola Corp., produce dealers.

15. *History of Architecture . . . of Greater New York*, II, 169. A fine lithograph view of the Novelty Works, as of about 1850, is reproduced in color in John A. Kouwenhoven, *The Columbia Historical Portrait of New York* (New York, 1953), p. 205.

16. *History of Architecture . . . of Greater New York*, II, 169.

17. *Ibid*, II, 171. One is designated as being located on Broadway near Fulton. This might mean the Milhau drugstore, but, if so, the date is a year too late. In Bogardus' pamphlet (*op. cit.*), the list of customers, except for Milhau and Laing, does not include any others whose buildings appear to have been constructed by this time (cf. n. 51).

18. *Architects' and Mechanics' Journal*, I (1859). The October issue (p. 23, and an advertisement) still gave the Centre and Duane address. In November (pp. 47, 50), removal to the new locations was reported. In 1860, Bogardus' new office was listed at 198 Canal and in 1861 at 200 Canal where it remained until his death (*Trow's New York City Directory*).

19. Vol. 8, No. 97, p. 2. The item was copied by the *Daily Gazette* on the following day (Vol. 21, No. 6209, p. 2).

20. Vol. 5, No. CCXLII, p. 464.

21. On August 5, 1847, Winthrop B. Smith and Co., publishers and booksellers, were reported to have enlarged their Main Street store to five stories and doubled width, and "with new cast iron fronts" (*Daily Times*, Vol. 15, No. 2177, p. 3), but this could mean only ground-story shop fronts of iron with masonry walls above. Other blocks of stores for Millius, Loring, Dexter, and the Methodist Book Concern were noted on August 24 as improvements in 1847, but without mention of iron (*Cist's Advertiser*, p. 3, quoted from the *Daily Gazette*).

22. [*J. A.*] *Robinson and Jones' Cincinnati Directory for 1846*, p. 509. Lathrop was listed in 1840 as a pattern-maker originally from Connecticut (D. H. Shaffer, *The Cincinnati, Covington, Newport, and Fulton Directory for 1840*, p. 256).

23. Charles Cist, *Sketches and Statistics of Cincinnati in 1859* (Cincinnati, 1859), p. 279. Greenwood first listed iron fronts among his products in 1850 (*Williams' Cincinnati Directory and Business Advertiser for 1850–51*, p. 53).

24. Greenwood was born in 1807 at Jersey City, New Jersey. In 1817 the family moved to Cincinnati where, after a brief attempt at farming on the Indiana frontier, the boy supported his invalid father by various menial jobs. In 1825 father and son joined the Owenites at New Harmony where the latter took charge of the mill's steam engine. After a sojourn in Pittsburgh to learn the foundry trade, he managed the community factory. After the colony disbanded in 1828 Greenwood returned to Cincinnati and in 1832 established the Eagle Iron Works. By 1850 he was the largest iron manufacturer in the West. In 1843 the burning of a large packing plant opposite the foundry, and in 1847 the destruction of his own shops by fire impressed Greenwood with the urgent need of incombustible buildings. In 1852 he won for the city its first paid fire de-

partment and built for it the first successful steam fire engine in the United States. His plant was a primary Northern arsenal during the Civil War. He founded the Ohio Mechanics' Institute and served as president of the company which built Roebling's Ohio River Suspension Bridge. He died in 1885. (*DAB*, "Miles Greenwood"; *Appleton's Cyclopaedia of American Biography* [New York, 1900], II, 758; M. Joblin and Co.: *Cincinnati past and present* [Cincinnati, 1872], pp. 101–5.) By 1859 Greenwood iron fronts had been erected in St. Louis, New Orleans, Chicago, Memphis, and Nashville (Cist, *Sketches*, p. 279).

25. J. Leander Bishop, *A History of American Manufactures from 1608 to 1860* (Philadelphia, 1868), III, 206–7.

26. *Illustrations of Iron Architecture made by the Architectural Iron Works of the City of New York* (New York, 1865), p. 4.

27. Patent No. 2554, dated April 11, 1842.

28. *History of Architecture . . . of Greater New York.* II, 167; *Illustrations of Iron Architecture*, p. 28.

29. *Doggett's New York City Directory*, 1849–50, 1850–51.

30. Roger H. Newton, *Town and Davis, Architects* (New York, 1942), p. 184. A view is given in Herman L. Fairchild, *History of the New York Academy of Sciences* (1887).

31. François Thiollet, *Serrurerie de fonte et de fer recémment exécutées* (Paris, 1832). Plate 20 illustrates three single-story fronts in the Rue Vivienne, No. 12, designed by Billaud.

32. William Pole, ed., *Life of Sir William Fairbairn, Bart.* (London, 1877), p. 174; Samuel Smiles, *Industrial Biography, Iron workers and Toolmakers* (London, 1863), p. 330; William Fairbairn, *Useful Information for Engineers* (2nd ser.; London, 1860), p. 226.

33. Pole, *op. cit.*, quoting Fairbairn's paper in *Minutes of Proceedings, Institution of Civil Engineers*, 1843, p. 125; William Fairbairn, *Treatise on Mills and Millwork* (London, 1865), pp. 252–4. William Fairbairn, "On Iron as a Material for Building and Decoration," a paper read June 10, 1844, before the Royal Scottish Society of Arts, cited for special thanks, not printed in the Society's *Transactions*, but published in abridgment as "On the Uses and Adaptation of Iron as a Material for Building," *Civil Engineers' and Architects' Journal*, VII (June, 1844), 249. Iron construction was adopted primarily as a safeguard against the notorious fires of Constantinople where most buildings were of timber and Moslem fatalism made fire-fighting more than casual.

34. *New York Evening Post*, Aug. 12, 1842; *Daily Cincinnati Gazette*, Vol. 16, No. 4916, May 23, 1843; the *Journal of the Franklin Institute* reprinted almost immediately similar items from numerous British publications; even the trade periodicals were surprisingly active in this regard. During the early 1840's, British and Belgian sheet iron houses were noted in many American journals.

35. *History of Schuylkill County, Pennsylvania* (Albany, N.Y., 1881).

36. John Haviland, *An Improved and Enlarged Edition of Biddle's Young Carpenter's Assistant* (Philadelphia, 1833), p. 45, Plate 60; Turpin C. Bannister, "The Architectural Development of the Northeastern States," *Architectural Record*, Vol. 89 (June, 1941), p. 74.

37. *History of Schuylkill County.*

38. Piotre Artamof, *La Russie, historique, monumentale, et pittoresque* (Paris, 1862), I, 56; Paul Planat, *Encyclopédie de l'Architecture et de la Construction* (Paris 1888–93), "Staroff"; Architectural Publication Society, *Dictionary of Architecture* (London, 1853–92), "St. Petersburg." The arch was of granite faced with iron plates cast by the English engineer, Clark, who was governor of the Imperial Iron Foundry.

39. Thiollet (*op. cit.*, Pl. 21) shows the two-story front of the Café de Malthe, built on the corner of the Rue and Boulevard St. Martin by the architect, Paul Lelong, *fils*. No date is given, but, since Thiollet certainly offered it in 1832 as *à la mode*, it probably was concurrent with the Pottsville bank.

40. *Hazard's Register of Pennsylvania*, April, 1830, p. 232 (quoting the *Pottsville Advocate*), and July, 1830, p. 400 (quoting the *Miners' Journal*). Since Haviland inserted it in his 1833 edition of Owen Biddle's *Young Carpenter's Assistant*, which down to the Civil War remained the most influential American handbook on building construction, it gained prompt and wide recognition.

41. The discovery, documenting, and publicizing of the Penn Mutual and its importance were accomplished by Charles E. Peterson (*Journal of the Society of Architectural Historians*, Vol. IX, No. 4 [December, 1950], pp. 24–25).

42. *Ibid.*

43. Both Bogardus (*op. cit.*) and Badger (*Illustrations of Iron Architecture*) stressed the prejudice they had met against the structural use of cast iron due to the failure of certain British structures and the fear that it would crush, melt, crack, and attract lightning.

44. Bogardus claimed to have conceived the reproduction of richly modelled historic styles while in Italy in 1840 and thought that "Their general introduction would tend to elevate the public taste for the beautiful and to purify and gratify one of the finest qualities of the human mind." He noted that elaborate designs increased the cost very little, and rationalized that the only danger lay in ornamental buildings which lacked structural stability (*op. cit.*).

45. The critical arguments culminated in December, 1858, in the papers read before the American Institute of Architects by Henry Van Brunt (pro) and Leopold Eidlitz (con). These were discussed in the *Scientific American* and the *Architects' and Mechanics' Journal* (Vol. 1, [1859], November, pp. 28–9; December 3, 31, pp. 51–2, 83). A rejoinder in the latter (December 24, p. 77) was signed "Vindex," who was surely Bogardus himself.

46. J. T. Scharf, *History of Baltimore, City and County* (Baltimore, 1881), p. 621 and illustration opposite p. 618; G. W. Howard, *The Monumental City, History, Resources, and Biography* (Baltimore, 1872), p. 57; Richard H. Howland and Eleanor P. Spencer, *The Architecture of Baltimore, a Pictorial History* (Baltimore, 1953), p. 88, Plate 65. The building was destroyed in the great fire of 1904.

47. *Illustrations of Iron Architecture*, p. 23.

48. Turpin C. Bannister, "The Genealogy of the Dome of the United States Capitol," *Journal of the Society of Architectural Historians*, Vol. VII, No. 1–2, (January–June, 1948), pp. 1–31; *Documentary History of the Construction and Development of the United States Capitol Building and Grounds* (Washington, 1904), pp. 341–4.

49. *Doc. Hist.*, pp. 348, 1027. The highest bid, submitted by Erastus Corning of Albany, was for $87,636; Bogardus asked $72,518, but Janes, Beebe and Co. easily won the contract at $59,872.

50. "The Harper Establishment, or How the Story Books are Made" (in Jacob Abbott, *Harper's Story Books* [New York, 1855 (?)]); *Visitors' Guide to Harper and Brothers Establishment* (New York, 1891); J. Henry Harper, *The House of Harper* (New York, 1912), pp. 92 ff.

51. New York customers: Milhau; Harper and Brothers; the McCullough and Tatham shot towers (described later in this paper); and the following stores (dates and addresses deduced from changes in *Doggett's New York City Directory* (1850–56) and *Trow's New York City Directory* (1857–60):

1851? [O.] Blunt and Syms, guns, 177 Broadway [or 1858 at 300 Broadway]
1854 H[enry S.] Sperry and Co., clocks, 338 Broadway
F[rancis] Hopkins and Brothers, glass, 61 Barclay
Emigrant Industrial Savings Bank, 51 Chambers [Robert J. Dillon, lawyer, also listed, was vice-president of the bank, and, therefore, probably not a direct purchaser].
1855 Charles O'Connor, tailor, 129 Cedar
Christal and Donahue, paints, 226 Pearl
John H. Sherwood, shoes, 9 Park Place
Spofford and Tileston, commission merchants, 29 Broadway
1856 McKesson and Robbins, drugs, 91 Fulton
1858 George [W.?] Bruce, hardware, 39 Warren
Douglass Robinson, insurance [?], 33 Pine

William H. Munn, lawyer, is also listed, but no building can be deduced, unless he was connected with Munn and Co., publishers of *Scientific American*. This is plausible since this journal often advocated iron buildings.

It is curious that Bogardus did not list one of his largest New

York projects, the Thompkins Market-Seventh Regiment Armory, Third Avenue, Sixth and Seventh Streets. Theodore Hunt built the vast three-story iron hall, 135 by 225 feet, in 1856–60 from plans by Bogardus and Lafferty (Stokes, *Iconography*, V, 1865, 1870, 1888; *King's Handbook*, pp. 496, 749, 754).

52. *Architects' and Mechanics' Journal*, I (October, 1859), 23.

53. A. T. Andreas, *History of Chicago* (Chicago, 1886), p. 87. Johnson was born in 1830 at Manchester and learned the building trade with the Manchester builders, Robert Neil and Sons. In 1849 he established his own business.

54. Bishop, *op. cit.*, p. 204.

55. *Illustrations of Iron Architecture*, Pl. 3. The building is now occupied by the Broadway Manufacturers' Supply Co. Its passenger elevator, the first commercial installation, was furnished by Elisha Graves Otis.

56. At Baltimore in 1851 Bogardus' Sun Building immediately stirred Hayward, Bartlett and Co., leading stove manufacturers, to open an architectural iron department (Ferdinand C. Latrobe, *Iron Men and their Dogs* [Baltimore, 1941], p. 18). The firm supplied part of the ironwork for the Harper Building in New York, and in 1856 shipped 265 tons of iron fronts to that city (*ibid.*, p. 22). In 1870 it sent a three-story front for the Corbett Building, 531 SW First Avenue, Portland, Oregon (*ibid.*, pp. 14–15). By 1872 it had cast at least eight fronts for Baltimore buildings, and others for Richmond, Raleigh, New Orleans, and Galveston (Howard, *op. cit.*). Also in 1851 Williams and Adams' Novelty Iron Works of Cincinnati began to compete with Lathrop and Greenwood in manufacturing "house fronts" (Cist, *Sketches*, p. 199).

57. *A History of Real Estate, Building, and Architecture in New York City during the last quarter of a century* (New York, 1898), p. 459.

58. *Loc. cit.*; *Architectural Record*, I (1891–2), 244; *History of Architecture . . . of Greater New York*, II, 164–6. Kellum had previously used many Badger fronts (*Illustrations of Iron Architecture*, pp. 25–33).

59. *The Pacific* (San Francisco newspaper), December 29, 1854. I am indebted to Charles E. Peterson for contributing this item.

60. During the 1850's, the following U.S. patents related to iron front construction were granted:

1. 1851, No. 7951, Joseph Banks, New York: Improved connexion for the Beams and Columns of Iron Buildings. (A system of interlocking lugs and flanges cast in the members of iron fronts.)
2. 1851, No. 7993, Simon Willard, Cincinnati: Construction of Metallic Buildings. (Floors, walls, and roofs of wrought-iron sheets with bent flanges.)
3. 1853, Michael B. Dyott, Philadelphia: Improvement in Facing or Veneering Buildings. (Cast-iron plates fastened to masonry by spikes driven through flanges. Joints waterproofed by cement.) (Apparently an application only. Noted in *Report of the U.S. Commissioner of Patents* [1853], p. 286.)
4. 1854, No. 10,756, Stephen Colwell, Philadelphia: Using Iron for Buildings. (Iron skeleton units, joined by H-shaped keys, covered by iron plates.)
5. 1854, No. 11,290, Charles Mettam (architect), New York; Construction of Iron Houses. (System of jointing of cast-iron members.)
6. 1854, No. 11,509, Amos J. Saxton, Brooklyn: Mode of Constructing Iron Buildings. (Elaborate system of interlocking joints of iron structural members without use of bolts, rivets, or nails.)
7. 1854, No. 11,809, Bernard J. LaMothe, New York: Iron Building. (Members formed by laminated plates or bands.)
8. 1855, No. 13,379, D. D. Badger, New York: Iron House. (System of connecting cast-iron members by flanges.)
9. 1856, No. 14,208. Harriet V. (William D.) Terry, Boston: Mode of Constructing Cast-Iron Buildings. (System of cast-iron boxes, plates, and ties to form hollow walls.)
10. 1859, No. 22,542. A. J. Bowers: Iron Column. (Sides of square column joined by wedges.)

61. I. T. Frary, *They Built the Capitol* (Richmond, 1940), p. 194.

62. *Illustrations of Iron Architecture*, pp. 23–35. The company had the great advantage of producing store fronts, with its patent rolling shutters, which were in strong demand for masonry-walled structures. Badger's prosperity, unlike Bogardus', was therefore not entirely linked with multi-story iron façades.

63. Of the 419 projects in New York and Brooklyn, architects were named for 174. Those most frequently named were (Griffith) Thomas and Son, J. B. Snook, R. G. Hatfield, (John) Kellum, J. F. Duckworth, and S. A. Warner, but James Renwick and Richard Upjohn were also represented. Many other fronts, though listed without architects, may well have been so designed. Almost all of the multi-storied façades had architects. However, Badger's stock designs were also of high quality; most of these were created by George H. Johnson whose taste and skill were amply proved by his five-story Gothic façade built in 1860 for the Grover and Baker Sewing Machine Company, 495 Broadway, just north of the Haughwout Store (Kouwenhoven, *op. cit.*, p. 326). The fact that Hanford was officially the architect of this building suggests that some practitioners took the easy course of securing design service, in addition to production, from Badger's firm (*Architects' and Mechanics' Journal*, I [October, 1859], p. 23). This extra service may well explain the increasing success of the Architectural Iron Works. Another factor was probably Badger's emphasis of architects' names in his list, a courtesy which Bogardus apparently neglected.

64. *History of Real Estate . . . in New York City*, pp. 125–7; but the trend had already started by 1865 when Badger listed a five-story front designed by Kellum and built for A. T. Stewart at 18 Mercer (*Illustrations of Iron Architecture*, p. 31).

65. G. W. Bromley and Co.: *Atlas of the City of New York, Borough of Manhattan* (Philadelphia, 1931), Pls. 1–32.

66. *Trow's New York City Directory*, 1858 to 1873; *Architects' and Mechanics' Journal*, I, October, November (p. 50), 1859, and several subsequent issues. A peculiarly exaggerated claim was made for Bogardus in 1851 in the *National Intelligencer* (reported and countered in the *Scientific American*, VI [June 28, 1851], 325) which asserted that he had initiated the principles of cast-iron construction, spread them in Britain during his stay there, and thus inspired Paxton and his Crystal Palace! The *Scientific American* deprecated such obvious chauvinism and cited in refutation several early cast-iron bridges and the cast iron lighthouse built in 1824 at Glasgow (see n. 88).

67. *Doggett's New York City Directory*, 1845 to 1850; *Rode's New York City Directory*, 1852; *Trow's*, 1854 to 1857.

68. XII (1849), 250.

69. This argument recalls the purpose of the iron fire plates for the covering of ceilings which David Hartley patented in England in 1773 (Winchcombe Saville Hartley, *An Account of the Invention and Use of Fire-Plates* [London, 1834]; Great Britain, H. M. Patent Office, *Alphabetical Index of Patentees and Applications for Patents of Inventions* [London, 1854], p. 254). The fact that Hartley's book appeared only two years before Bogardus' arrival in London suggests that he could easily have known it.

70. Abbott, *op. cit.*, p. 25. The girders were manufactured by James L. Jackson (*ibid.*, p. VIII).

71. Issued 1855. A copy is in the Landauer Collection, New-York Historical Society. I am indebted to Charles E. Peterson for bringing this item to my attention.

72. Abbott, *op. cit.*, p. 32 ff.; Allan Nevins, *Abram S. Hewitt, with Some Account of Peter Cooper* (New York, 1935), pp. 86, 101, 111, 114–116.

73. Agnes A. Gilchrist, "Market Houses in High Street," in Luther P. Eisenhardt, ed., *Historic Philadelphia, from the Founding until the Early Nineteenth Century* (*Transactions, American Philosophical Society*, Vol. 43, Part 1), (Philadelphia, 1953), pp. 305–9.

74. Fairbairn, *Treatise on Mills and Millwork*, pp. 252, 254.

75. Reprinted in *Architects' and Mechanics' Journal*, I (November, 1859), 47.

AMERICAN NOTES

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BENJAMIN LOXLEY AND CARPENTERS' HALL

From our desk we can see nearby Carpenters' Hall—now an important feature of the Independence National Historical Park Project—a building interesting in several ways. As the meeting place of the First Continental Congress in 1774 it is well known to historians of Revolutionary politics. It was designed by Robert Smith, who probably had the greatest practice of any of our Colonial architects. It is also remarkable as the home of what is today our oldest building trades organization; 1957 will be its centennial year as an historic American "shrine." If we take Washington's Headquarters at Newburgh on the Hudson as the first historic house museum,[1] we might call this the second. Restored by its original owner and builder —the Carpenters' Company of the City and County of Philadelphia—the Hall was opened free to the public in 1857, a pioneer event in architectural preservation.[2] The care taken of this famous Philadelphia landmark by the Company—a small private organization of builders—is a really remarkable accomplishment for which it deserves the gratitude of the American people.

In a small collection of documents preserved by the late Charles E. Loxley of Paoli, Pennsylvania, is a typed copy of the autobiographical essay left by an 18th-century Philadelphia carpenter titled "Benjamin Loxley's Account of his Ancestors of his Parents and of himself and Family" dated June 20, 1789.[3] Loxley was a prominent builder in a period of great growth. These men were seldom literary and information about them is today relatively hard to find.

Leaving out much of Loxley's military career (he played an important part in the French and Indian and Revolutionary Wars) we reproduce here his recollections of the early years. The story is, perhaps, typical of the ambitious, hard working 18th-century immigrant making good in the New World.

THE AUTOBIOGRAPHY

My Father's name was Benjamin Loxley of Wakefield in Yorkshire, in old England, a Weaver and Cloth Dresser and Presser, son of an ancient line of Loxleys in those parts likewise of Surrey and of Staffordshire and Warwickshire, industrious, sober, religious Church men, and good warriors in defence of their rights and privileges.

My Mother's name was Elizabeth Loxley, a daughter of Richard Pullen and Elizabeth his wife,—large and numerous family, very industrious sober, religious and right down Englishmen, Tanners and Linen Weavers and Bleachers in Yorkshire near Naigburn, Pately Brigs, Harrigate Spas, Leeds and Bradford.

I was born on December 20, 1720. My Parents kept me at school constantly from four years old till I was upwards of thirteen years old. I was their oldest child and they were very proud of me. . . .

In the Fall of 1733 my Mother's youngest brother, Francis Pullen, came from Philadelphia, Penna. in North America where he had lived about 15 years near Brandywine, following Tanning and Weaving, and had gained a good fortune. He had been married twelve years, but had no children. He came to see his relatives. He had made a will leaving the greater part of his estate to one such of his brother's or Sister's sons as would come with him and live with him until his death, all excepting what he had given to his widow. But none of his cousins would venture to come across the sea with him but me,—BENJAMIN LOXLEY.

My uncle and I left Wakefield February 14, 1734 and arrived in 3 days at London, where we lived at our cousin Wilks and among our other relatives there about a month, viewing all the curiousities there and waiting for the ship "Constantine", Cap't Edward Wright, Commander, with whom we sailed for Philadelphia, 24th., March and arrived after a long voyage of fourteen weeks, through the kind protection of our good God, safely at our desired Port the beginning of July. We found my aunt well in health living at Rev. W. Jenkin Jones' a Baptist Minister a very good man and a steady friend, where she had boarded in my uncle's absence. In a short time after we removed to a good farm, about six miles from Philadelphia that belonged to my uncle, where we settled and made large improvements on it.

Then I chose to learn the Carpenter's and Joiner's trade, after I had lived near three years with him at hard work. He bound me for five years to W. Joseph Watkins, where I learned the Carpenter's, Joiner's and plain Cabinet making trades. They used me exceeding kind. I was free May 7, 1742. I worked Journey work for my master about two mos. then joined partnership with William Henderson, July 31, 1742. I had a choice chest of tools, books of architecture, a bible and Psalm book (N.B. The tools were saws, augurs, bits, axes, adzes, etc. etc. such as I could not make to the amount of £35 7s 12d) I went on right well and got plenty of work and good pay. I have had many apprentices and servants. . . .

I then got married to Miss Jane Watkins, only daughter of William Abram Watkins and Hester his wife and sister of my master Joseph Watkins, from Abergeny in Wales.

I got a good interest and a good wife and had three sons by her. . . .

On the 22d of Sept. 1750 my wife Jane Loxley departed this life and is buried in the Baptist burial ground in Philadelphia by her Father, Mother and son and a great many of her relatives, in a vault built at my expense, adjoining Second St. new Meeting House.

Catherine Cox, the second wife of Benj. Loxley is the oldest daughter of Mr. John Cox, farmer and Mary, his wife, of Upper Freehold in East New Jersey. . . .

In 1739 and 1740 I learned Blakeney's exercise of Gov. Geo. Thomas and was chosen an officer in the Militia. At our Fort all through the Spanish war until 1747 I taught the exercise to a great many in this province. In 1755, after Gen. Braddock's defeat I learned Laboratory work, Gunnery and Bombadoreing, of Engineers Gordon and Bream and sundry other of Braddock's defeated men.

In 1755 I borrowed four cannon of Capt. Andrew Hodge, mounted them on travelling carriages and began the artillery company of Philadelphia. A great number of Tradesmen, Carpenters, Masons, Smiths &c. met at our State House and chose old George North Captain and myself Captain Lieutenant and John Goodwin 1st Lieut. and James Worrel, 2d. Lieut. We chose all our under officers and formed a company of 107 men, officers included. We made a very great progress in the Military art, both with our cannon and small arms, so that our Governor and Commissioners sent to England for two Brass Cannon, 12 pounders and two 6 pounders, all completely mounted and fitted. Also 1—8 inch mortar—pit on a bed, 100 shells, 100 fuses &c. and 112 stand of small arms for our company's use. With us we taught great numbers of the Militia, both officers and men, the use of the cannon. We had them in use all through the French war from 1757 to 1764. . . .

In the first campaign after Braddock's defeat I listed with Capt. David Hay to go his second Lieutenant in the King's Artillery and to get 12 men of our Philadelphia Artillery to go with me. So many of the officers and artillery men were killed at Monongahela that they did not know what to do. But W. B. Franklin, Capt. Jas. Coulter and others informed Gen. Forbes that I understood Laboratory work,

artillery duty, and stores, he sent Engineer Gordon and Commissary Henry Ward for me to go to his quarters and after asking me many questions he sent for Capt. Hay and ordered him to strike my name out of his muster roll as he had other duty for me to do. The next morning he sent me a commission and written directions by the Rev. Rd Peters how to proceed and ordering me to take charge of all the King's stores in this place or that may arrive from England. . . . I went through this duty for near seven years much to their satisfaction and my own and we settled agreeably, they paying me according to our engagement.

In 1776 by order of our Commander in Chief I marched my artillery company to Amboy to prevent the British army from crossing the river from Staten Island to the Jerseys. There we could talk together across the river and sometimes fired across until I was ordered back to Philadelphia by Congress to build a furnace and boring mill to mould and cast brass cannon and bore them and fix them fit for duty.

In April 1783 I moved my wife and family into Philadelphia again to my old house near the drawbridge. I found five of my buildings torn down and burnt to the ground and great damage done to the other interests I had in different parts of the city and Liberties. My hay barracks and fences were stolen away and my meadows were ruined. A large quantity of my goods and my work was stolen out of my houses and my shops. A calculation made shows that I have lost above $60,000.

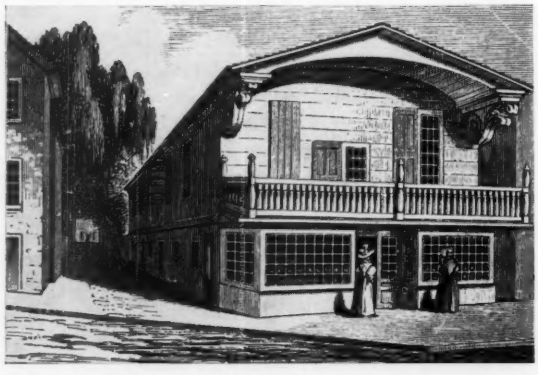
According to the Philadelphia directories, which began in 1785, Loxley spent the last years of his life in his "Mansion House" on lower Spruce Street near the drawbridge which crossed Dock Creek joining Budd's Row and the Blue Anchor to Society Hill. He died on October 15, 1802, his funeral "Attended by the Carpenters' Society of which he was the most ancient member and a numerous concourse of relatives and friends." He was buried alongside his wife at the Second Street Baptist Meeting House of which he himself had directed the building. "As a mechanic," continued *Poulson's American Daily Advertiser* for October 22, 1801:

Mr. Loxley was conspicuous for talents, ingenuity and industry; as a citizen, distinguished for active participation and usefulness; and as a man, for integrity and the faithful discharge of the various duties of social life. He laid the foundation of the ancient artillery corps of this city, and commanded the first company associated during the war proceeding our revolution at the dawn of which the corps was encreased to a battalion, of which he was major—and rallying round the standard of liberty, they continued its firm and unflexible defenders. His disinterested services, aided by his skill and ingenuity in casting of cannon, and conducting the public laboratory in the early stages of the revolution, when the knowledge of those arts were confined to a few, were of the highest importance to our country. He had the esteem of all who new him and by whom his memory will long be cherished with respect.[4]

More should be learned about Loxley's career as a builder and dealer in construction materials.

In our notes—and in some kindly supplied by Louise Hall—we find that Loxley in 1745 took one John Dight as an apprentice.[5] In 1752 he subscribed £12 for the construction of the Pennsylvania Hospital,[6] which may mean that he intended to supply work of that value. In the same year his petition for the use of two wooden wharves in the Delaware at the foot of Dock Street was granted by the Common Council. Within five years he had put up some buildings nearby.[7] Loxley seems also to have been in the lumber business for in 1753 we find that he furnished the shingles for Robert Smith's steeple to Christ Church [8] and boards for the new Loganian Library on Sixth Street facing the State House Yard.[9] We also know that he worked on the Delaware River Battery in 1756,[10] a fortification erected for the defense of Philadelphia during the French and Indian War.

Perhaps his most important job was the First Baptist Meeting House near Second and Arch Street. This "neat brick building, 61 feet by 42, with pews and galleries, erected in 1762 at the charge of £2200" [11] stood in Fromberger's Court (later LaGrange or Ledger Place and now Cuthbert Street) [12] just north of Christ Church. A scrap of a memorandum by Loxley shows that on May 1, 1762, he went to a stone quarry and then to Mount Holly, New Jersey, for scantling and on May 7 up the Schuylkill to procure timber for "the Large Roof & Galleries." On September 20 the scaffolding was struck; on October 14 the galleries were raised and on January 6, 1763, Loxley "made the Cistern & laid it in the M[eeting] House." [13] No adequate view of the structure in its original form exists.[14]



Philadelphia. Loxley House, Little Dock Street, built *c.* 1760.

Presumably Loxley built the several houses he owned along Spruce, Little Dock and Second Streets, including the surprising little two-story frame dwelling—looking like a Swiss chalet—famous in Philadelphia annals as the setting of the Lydia Darragh story. Among his other projects there seem to have been the speculative development of some lots on "Artillery Lane" in the Northern Liberties and "Loxley Court," a cul-de-sac still called by that name, north of Arch Street between Third and Fourth Streets.[15]

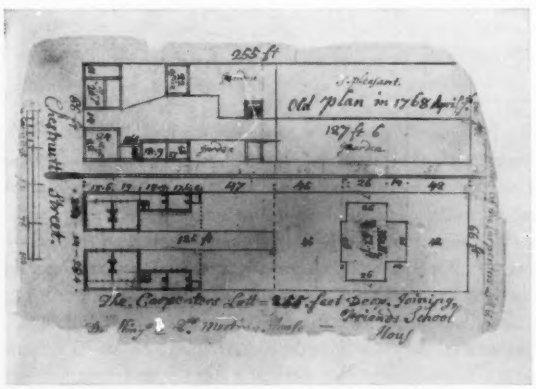
Loxley was an active participant in the affairs of the

Carpenters' Company. According to Louise Hall he signed the "Articles" of the Company in 1763, and in that year was appointed to the committee on prices and to another charged with selecting a site for the new hall. In 1770 he subscribed generously to the building fund. Loxley continued in the Company records until in April 16, 1798, when the minutes show that "our Antient Member Benjamin Loxley is Incabible [*sic*] through Indisposition and Old Age from meeting" and the usual fines for absence were remitted.[16]

BUILDING CARPENTERS' HALL

In the Dilks Collection, a group of documents recently purchased by the Historical Society of Pennsylvania, is a small paper-bound volume entitled "Benjamin Loxley's Memerandum Book, Made and Begun the 6th of June 1768, concerning the Carpenter's Companys Interest and Building &cccc." [17] This little volume contains many points of information about the construction of the Hall not available elsewhere. Included are a scale layout of the buildings standing in Carpenters' Court when it was purchased by the Company two years earlier and a plan proposing a symmetrical forecourt (see illustration).

Entries show that on January 6, 1768, Loxley and Thomas Neville, another prominent member, made an



Loxley's Plan of Carpenter's Court, 1768. Above: existing conditions; below: proposal for a symmetrical court, new Hall in rear. (Historical Society of Pennsylvania)

agreement with George Emlen for the lot which fronted sixty-six feet on Chestnut Street "with all the Buildings & Improvements thereon Erected." Six days later Robert Smith was appointed to join with them in this transaction which was soon completed, the Company agreeing "to Build on the S[d] Lott 2 or 3 Story high 36 by 22 of Brick or Stone" within three years' time, and also agreeing not to tear down any of the existing structures without replacing them. The consideration was £66 per year rent with the right of purchase for 3520 dollars.

Loxley listed the buildings taken over from Emlen which consisted of a frame house (the "front" or Fawcitt house, built 1713) a shop, an office and two kitchens. These buildings were let separately and rent collected from each tenant. Repairs were made at once on the Front House under the direction of Joseph Rakestraw and we find Loxley furnishing part of the men and materials, which included nails, spikes, HL hinges, a well chain and glass and glazing for "the old leaden windows."

The erection of the proposed Hall was going to be quite a venture and it was decided to finance it by the sale of stock to the members of the Company. Loxley kept a list which was opened on January 30, 1770, entitled "Subscribers, Names & Sums for a Hall." It is worth quoting here because it contains the names of some of the most prominent builders of Philadelphia and differs somewhat from other lists. We have kept Loxley's spellings:

Joseph Fox (6 shares)	£24.0.0	John Hitchcock (1¼ shares)	£5.0.0
Robert Smith (5 shares)	20.0.0	Thos. Nevel (3 shares)	12.0.0
John Goodwin (4 shares)	16.0.0	Silas Engles (1½ shares)	6.0.0
Abram Carlile (3 shares)	12.0.0	William Colladay (1½ shares)	6.0.0
Patrick Craigehead (1 share)	4.0.0	James Worrel (5 shares)	20.0.0
Joseph Reakstraw (3 shares)	12.0.0	Willm Robinson (1½ shares)	6.0.0
James Pearson (4 shares)	16.0.0	Willm Roberts (1 share)	4.0.0
Benjamin Loxley (5 shares)	20.0.0	James Davis (2½ shares)	10.0.0
Levi Budd (1¼ shares)	5.0.0	Isaac Lafever (1½ shares)	6.0.0
Richard Armit (3 shares)	12.0.0	John Trip (1 share)	4.0.0
James Bringhurst (3 shares)	12.0.0	Saml Wallis	
William Lowance (1½ shares)	6.0.0	Joseph Roads (3 shares)	12.0.0
Thos. Shoemaker (3 shares)	12.0.0	James Potter	4.0.0
Isaac Coats (5 shares)	20.0.0	Robert Carson	8.0.0
George Wood (1½ shares)	6.0.0	Saml Griscome	6.0.0
Saml Powel (1 share)	4.0.0	Benjn Mifflin	4.0.0
James Armitage (2 shares)	8.0.0	Andrew Edge	3.0.0
John Thornhill (3 shares)	12.0.0		

Because the first campaign did not produce all the funds desired, it was decided "to apply to Several Others who are intimately Conected with them in the Building Business and from whome they have had great Encouragement and kind offers of Assistance . . . as they are willing to give either money work or materials, which they promise to pay to Joseph Fox Esq[r], Master and Treasurer of the S[d] Company." This produced a few more contributors as follows:

John Roberts Miller	£5.0.0	Hercules Courtney work	£20.0.0
William Anderson plaist[r]	2.0.0	Charles Woolfall 100 ft.	
Francis Garrigues	5.0.0	[?] pd & used at Hall	
Jn[o] Allen	5.0.0	Andrew Read, Iron Backs	5.0.0
		Robert Wright p. day [?]	5.0.0

Loxley noted that on February 13, 1770, that "We Mett & Examin'd the Drafts again & agreed then Appointed Each member of the Committe to his perticular Charge in Collecting Materials & Building the Carpenters Hall 50 ft. by 50 ft." He also gives the intended vertical dimensions as follows:

Cellar	9.6	Roofe	.....
1st Story	15.0	Cupola	.....
2d Story	12.0	Doome	.....
2 floors	2.0	Spindle	.....
	38 ft. 6 in.		

The accounts show that Loxley was busy with the construction of the Hall all through the building season of 1770. Among other items at this time he supplied "Rum & Nails for Digers" and lumber (boards, planks, scantling,

joists and scaffold poles) and he hauled various materials to the site. In addition, he furnished the work of half a dozen men and worked personally, for which he allowed 6/6 per day.

We have seen elsewhere that the second floor of Carpenters' Hall was first occupied by the Library Company of Philadelphia in 1773 and the lower floor by several revolutionary committees and the Continental Congress in 1774. In the succeeding years it was used as a bank, custom house, school house and auction house and for public meetings generally up until 1856, when the conscience of the Company induced them to dedicate it to historical uses. The fabric was then restored and opened to its present uses at a formal meeting on September 5, 1857.[18] This restoration was not what we today would call "authentic," but revisions have been made through the years since then and today the exterior—never much changed—is considered one of the most attractive examples of 18th-century architecture in Philadelphia.

* * * * *

One of Loxley's most intriguing passages is a short note towards the end of the book: "The Company of Carpenters of Philadelphia 172 6/7 Began in feby as p^{r} Book at M^{r} Foxes." Nothing is known of the founding of the Company except the year is generally accepted, through tradition, as 1724. Unfortunately, the papers of Joseph Fox, one of the greatest of Philadelphia builders, and one of the most influential men in the province, have not come to light in modern times. But the attics of the community are still loaded and anything can happen yet.

1. Lawrence Vail Coleman, *Historic House Museums* (Washington: American Association of Museums, 1933), p. 18. For its story see Dorothy C. Barck, "Washington's Newburgh Headquarters," *JSAH*, Vol. XIV, No. 2 (May, 1955), pp. 30–32.

2. A historical sketch of the Hall may be found in Charles E. Peterson, "Carpenters' Hall," *Historic Philadelphia, Transactions of the American Philosophical Society, Vol. 43, Part I* (Philadelphia, 1952), pp. 96–126.

3. Complete typed copies can now be found at the Carpenters' Company Library and the Historical Society of Pennsylvania. A selection from the whole was published in the *Germantown Crier*, Vol. 5, No. 3 (September, 1953) pp. 13–14. The original manuscript version is said to have been lost years ago.

4. John F. Watson, *Annals of Philadelphia* (Philadelphia, 1927), Vol. I, says (p. 102) that Loxley managed the fireworks celebrating the capture of Cape Breton, (p. 103) that he was active during the "Paxtang Invasion" of 1762 and (p. 133) that he was allowed by the City to use the public square in front of his house on Little Dock Street in return for filling up the whortleberry swamp there.

Alexander Graydon in *Memoirs of His Own Time* (Philadelphia, 1846), (p. 47) gives a humorous account of Loxley during the "Paxtang Invasion," calling him "a very honest, though little, dingy-looking man."

5. *Pennsylvania Magazine of History and Biography*, Vol. XXXI (1907), 95.

6. *Pennsylvania Archives, First Series*, II:88.

7. *Minutes of the Common Council of Philadelphia* (Philadelphia, 1847), pp. 618–619.

8. Philadelphia, *Christ Church MSS, Box 26, Steeple Account* (July 26, 1753).

9. Library Company of Philadelphia, *Accounts of Loganian Library delivered by Thomas Fisher*, (Bound MS), "for Boards d'd for y^{e} use of y^{e} Library . . . £2/12/3" (October 4, 1753).

10. Historical Society of Pennsylvania, *Society Collection, Box 1A, Bills and Accounts.*

11. Description as of 1770 given by Rev. Morgan Edwards in William Williams Keen, ed., *The Bi-Centennial Celebration of the Founding of the First Baptist Church, etc.* (Philadelphia, 1899), p. 466. Edmund Hogan, *The Prospect of Philadelphia* (Philadelphia 1795), Part I, p. 31 called it "about 60 feet by 55, two stories high, with pews and galleries."

12. The building, drawn to scale, is shown, along with the school and graveyard on Hexamer and Locher's fire insurance maps of 1860 (Plate 8).

13. Historical Society of Pennsylvania, *John H. Dilks, Jr., Papers, Miscellaneous Box.*

14. An engraving of the structure as enlarged in 1808 is shown in Keen, *op. cit.*, p. 73.

15. "Valuation of the Estate of the Late Benjamin Loxley, the Elder, deceased," May 18, 1802, lists twelve buildings of brick, eight of wood and one of stone as well as several vacant lots and a small farm in Moyamensing (*Dilks Collection*).

16. Letter to the Editor, September 27, 1956.

17. These papers were brought to the Editor's attention by Mr. Harry Givens who accessioned them for the Society. An extended study of Carpenters' Court was made by James C. Massey now in Germany with our armed forces. Part of this was published in revised form entitled "Carpenters' School," *JSAH*, Vol. XIV, No. 2 (May, 1955), pp. 29–30.

18. Peterson, pp. 113, 114.

FOUNDING OF THE COMPANY

LOXLEY'S PROVOCATIVE NOTE

By LOUISE HALL
Duke University

The Editor's discovery of Benjamin Loxley's note challenging the traditional formation date (1724) of "The Company of Carpenters of Philadelphia" is vital for studies of master-groups in the building arts within the North-Atlantic community. Loxley's date—February, 1726/7—comes closer to being documentary than any, and recalls the Company's own futile efforts to arrive at the truth.

The Company, "having for many Years mett together," subscribed anew their undated "Articles" about 15 February 1763, date of their earliest extant minutes in similar format. Their printed price-book repeated the "many years" phrase in 1786.

Meanwhile, on 6 June 1768, Loxley began his "Memerandum Book," wherein he noted the crucial date from the "Book at M^{r}. Foxes" presumably before the death of the Company's beloved Master, Joseph Fox (1709?–1779). Company members Edward Warner (1696?–1754) and Joseph Fox had acted as co-executors in 1737 for the substantial estate of member James Portues [not "Porteus"] (fl. 1698–1737), whose apprentices both are said to have been until sworn freemen in 1717 and about 1730, respectively. As Assemblymen, Warner or Fox or both served the Province continuously from 1735 through 1771, and news

of the 1772 election prompted Benjamin Franklin to write home from London expressing regret over Mr. Fox's "omission." In or out of the craft, Mr. Fox knew what went on; his extant records as Master were faithfully and legibly kept. The chain of credibility is strong from 1727 down to the "Book at Mr. Foxes" in Loxley's decade, 1768–79.

After Mr. Fox's death in 1779, 10 years and 16 weeks elapsed before the Company laid claim to origin in 1724, the date spelled out in "An ACT to incorporate the Carpenter's Company of Philadelphia" passed by the Assembly on 2 April 1790. Loxley, on the committee to procure the Act, must have overlooked his "Memerandum Book." Memories failed. Eldest Incorporator Isaac Zane, Sr. (1710?–1794)—so ancient by 1790 as never to have subscribed the extant "Articles," nor attended any meeting now of record—had been a teen-ager in the 1720's, not a master-carpenter. By no means could he have been, as since alleged, an "Original Associator," nor is there evidence that he ever pretended to be such; when he died "near 84," his Monthly Meeting of Friends accounted him "Remarkable for innocency and honest simplicity."

Who the "Original Associators" actually were is as unfathomable a mystery today as it was in 1812, when the rival Practical House Carpenters' Society averred that the old Company had been formed "about the year 1786," the date of their printed price-book. Here was a curious enough assertion, inasmuch as a prominent Company member, admitted 1773, had then just taken apprentice in 1772 for six years a boy who grew up to be in 1812 a responsible Society official. The erstwhile master was the late Robert Allison (fl. 1768–1811), known for his work at the Court Room of the State House in 1778–79; his former apprentice, John Strickland (1757–1820), father of William the architect.

Apparently the Society's assertion piqued the Company into action too swift for thought. Wholly forgetful of the "many years" phrase in their "Articles," as well as the 1724 claim in the Act of 1790, they kept a committee busy through 1813–15 trying vainly to ascertain "who were the first members of the Carpenters Company, at the time the Hall was built," i.e., in 1770–74. One more passing generation, and the Company themselves came to believe, by 1833, that the "Articles of this Company, [were] entered into about the year 1786."

The ebb had been reached in the civilized feeling for continuity between past and future, much as it has been today in younger organizations, still heedless of their archives. For the Company, the tide was turned by an outsider, himself doubtless swept along by the general onrush of antiquarianism in his day: former Assemblyman William Bradford Reed, Esq. (1806–1876), Attorney General of the Commonwealth in 1838. On the 26th of February in that year, intent upon "Making Some historical enquiries relative to the Continental Congress of 1774," he successfully applied to the Company's Managing Committee for "permission to examine your records of that olden time." In 1839 he delivered before The New-York Historical Society his address on "The Infancy of the Union," published in 1840.

Thus carried along on the tide, the Company in 1841 set up a committee of five who struggled for months without avail to find answers for an unanswerable, ten-point questionnaire propounded by a fellow-member. His first breathless question alone demanded: "When and where the first meeting of this Company was held and if practicable who were present at the meeting and what were the several objects contemplated in the formation of this Company and whether those objects have been accomplished in whole or in part."

All things considered, it is now amazing that not until 1848 did any member seem to realize "that one of the old Minute Books belonging to the Company has been lost or mislaid." And it is still more amazing that the Company passed only in 1855 their unavailing resolution that "a Reward of One Hundred Dollars Be offered for the lost Minute Book."

Still possessed of their hundred dollars at the reoccupation of their "restored" Hall on 5 September 1857, the Company and their guests nevertheless listened to a discourse on their history. Within three weeks it was deemed advisable to appoint a committee "to revise the History of the Company read at the opening meeting." The results of that revision, typical of inventive writing a century ago, went into print the following year, 1858, in the first of several all too influential editions of the *Reminiscences*.

So were born the "Statistics." The one relative to origin in 1724 stemmed, of course, from the Act of 1790. The one about the bequest of "his collection of books on architecture to the Company" by James "Porteus" in "1734" must now be countered with the fact that no books whatsoever, nor the Company, found mention in the elaborately specific will signed by James Portues on 30 November 1736, proved 22 January 1736/7, and carried out by co-executors Warner and Fox. Other "Statistics" are equally difficult to substantiate.

Today, with Benjamin Loxley's provocative note brought to light, one may legitimately wonder whether he may not have jotted down his significant entry about the Company's formation in February, 1726/7, from the lost *Minute* "Book at Mr. Foxes."

For facilitating study of the MSS. from which quotations have been drawn, the writer is deeply indebted to the Officers of the Carpenters' Company, and especially to the Custodians of Carpenters' Hall, Mr. and Mrs. Charles E. Jackson. The note on Zane is owed to the kindness of Mrs. Edward Melson, Department of Records, Yearly Meeting of the Religious Society of Friends, Philadelphia. Dates of birth, apprenticeship, and death come from scattered sources, a few printed. Portues' will is in Will Book F–1, fol. 24.

CURRENT RESEARCH

CURRENT RESEARCH IN ARCHITECTURAL HISTORY

By PHYLLIS A. REINHARDT, *Art Librarian, Yale University*

THIS IS THE third report on research in progress to be published in the JOURNAL following the tradition established by Carroll L. V. Meeks in the summaries appearing in Volume IV, Numbers 3–4 (1944), and Volume VIII, Numbers 1–2 (1949). It is a compilation of sixty-three replies received in answer to a questionnaire concerning unpublished work mailed to the membership in December 1955. Analysis of the ninety-six projects reported indicates that the majority of members engaged in active research are concerned with the architecture of the United States. Some sixty-four projects deal with the architecture of North America and over half of these with that of the nineteenth century. There is a continuing trend towards biographical and regional studies, the latter frequently covering individual states.

Projects in other fields are varied in scope and limited in number as follows: three in the art of Antiquity, five in medieval architecture, ten in the Renaissance and the seventeenth and eighteenth centuries, and four in the twentieth century. Three are concerned with the art of Latin America and one with that of the Near East. Six projects consider aspects of the whole history of architecture. Four review developments in city planning. And five are concerned with the importance of structure.

The complete list of topics follows. Members have been most generous in indicating their willingness to provide further information upon inquiry. Their names will be provided upon request to the chairman of the Research Clearing House, who may be addressed as Art Librarian, Yale University, 56 High Street, New Haven, Connecticut.

PROJECTS IN PROGRESS

GENERAL HISTORY

- Syllabus for the History of Architecture
- Iron Inspires Invention
- History of the Use of Iron in Building Construction
- Town and Square—from the Agora to the Village Green
- Urban Form—Historical Development of Cities in Southern France
- Penology and Its Architectural Expression
- History and Development of Architectural Woodwork in Western Europe and North America

ANTIQUITY

- An Introduction to the Sculpture of Egypt
- The Monument of Philopappos in Athens
- The Stoa of Attalos II in Athens

THE MIDDLE AGES

- Syllabus: Medieval Architecture
- Southern French Romanesque
- Old St. Peter's Basilica, Rome—Interior Restoration
- A Study and Conjectural Restoration of Beauvais Cathedral
- Roussillon Vaults

RENAISSANCE AND XVII–XVIII CENTURIES—EUROPE

- Spanish Architecture, 1600–1800
- Art and Architecture of the Spanish and Portuguese Empires (The Pelican History of Art, due 1958?)
- The Representation of Interior Space in Architectural Drawings of the Italian Renaissance
- Oval Churches of the Cinquecento (published in German, 1955)
- Italian Architecture in the 16th Century (The Pelican History of Art, due 1957)
- British Provincial Architecture, 1763–1776.
- Ippolito d'Este II and the Villa d'Este—a Cultural Biography
- The Villa d'Este at Tivoli of the Cardinal of Ferrara
- The Architecture of Leone Battista Alberti
- Rodrigo Gil de Hontanon

XIX–XX CENTURIES—EUROPE

- The Evolution of the English Garden City Ideal, *circa* 1850–1950.
- A Study of the Influence of American Architecture in the Netherlands, 1900–1920
- *De Stijl*
- Inside the Bauhaus

THE NEAR EAST

- The Vault in Persian Architecture (and related vaulting problems)

LATIN AMERICA

- Art and Architecture of Ancient America (The Pelican History of Art, due 1958?)
- Mexican Colonial Architecture and the Architecture of Spain

NORTH AMERICA—GENERAL

- The Arts of Mexico and North America, a Survey
- Some Aspects of Twentieth-Century American Architecture
- Exterior Ornament in American Architecture
- History of Building Techniques in the United States during the 19th century
- Revivalism, Functionalism, and the Picturesque
- Greenough, Paine, Emerson, and the Organic Aesthetic
- Color in mid-19th-Century American Architecture
- The American Architectural Profession, 1865–1914
- The Influence of the Ecole des Beaux-Arts on the Architects of the United States

NORTH AMERICA—PARTICULAR

Regions

- Indian Mound Groups of the Eastern United States
- Historic Southwest Houses
- Meetinghouses in 17th-century New England
- Town Centers in the Western Reserve
- California Architecture in the Nineteenth Century
- An Historic Study of the Adobe Houses in California from the Spanish to the American Period, 1800–1852
- Folk Art of Louisiana
- Sculpture and Iron Work of the Rural Cemeteries of Louisiana
- Tidewater Maryland Architecture and Gardens
- Domestic Architecture of Massachusetts, 1620–1725
- The Federal Period in Ohio Architecture, 1795–1835
- The Italianate Bracketed Style in Central Pennsylvania
- Virginia Architecture of the Seventeenth Century
- Twin Cities Architecture

Individual Cities and Buildings

- Bell Grove Plantation, Louisiana
- Original Documents for Building the University of Virginia
- A Guide to Significant Chicago Architecture, 1872–1922
- Photographic Record of the Chicago School
- Chicago Architecture from the Columbian Exposition to the First World War
- Restoration of old Sands Homestead, Cornwall, N. Y.

Restoration Problems at Hamilton Grange
A Study of the Several Buildings of the Mutual Benefit Life Insurance Co. (Newark), 1845–1955
The Relationship of the Physical and Psychological Background of New Orleans to the Art Forms
List of New York Structures, 1918–1930
The New York Apartment, 1850–1895
Cast-Iron Architecture of New York City and James Bogardus, Architect in Iron
Nassau Hall, Princeton University
Restoration of Richmondtown, S. I., N. Y.
Architectural History of Sacramento, California
The Rotunda—1839–1955 (St. Louis)
Restoration of St. Luke's Church, Smithfield
Latrobe, Jefferson, and the National Capitol
The Public Buildings of Williamsburg, Colonial Capital of Virginia: an Architectural History
Historical Architectural Analysis of the Capitol Building in Williamsburg

BIOGRAPHIES

Peter Banner, Architect (1795–1820)
Asher Benjamin (unpublished papers)
Leroy S. Buffington, Architect
Carrère and Hastings Drawings
S. P. Cockerell (1754–1827)
Godefroy in Europe
Biography of Walter Burley Griffin
Architectural Work of John Haviland
Jefferson's Recommendations for a Fine Arts Library for the University of Virginia
The Architecture of John McComb
Journal of John Notman, Philadelphia Architect, 1849
The Life and Work of Bruce Price, American Architect, 1845–1903
William Gray Purcell and George Grant Elmslie: Architectural Pioneers (1900–1920)
History of the Architectural Firm of Shepley, Bulfinch, Richardson and Abbott and Predecessor Firms since 1886
William Sprats, Architect (1780–1810)
European Sketchbook of William Strickland, 1838
Louis Comfort Tiffany
Thomas U. Walter
Athens on High Street, the Architectural Works of Thomas Ustick Walter in West Chester, Pennsylvania (1830–1848)
Did Thomas Ustick Walter Build "Physick's Folly"?
Thomas Ustick Walter's Breakwater, La Guaira, Venezuela (1843–1844)

BOOKS

PAUL F. NORTON, *Editor*

The Pennsylvania State University

Talbot Hamlin, *Benjamin Henry Latrobe* (New York: Oxford University Press, 1955), 633 pp., 40 plates, 36 figures. $15.00.

That Talbot Hamlin should write the definitive biography of "America's first professional architect" was no surprise to his friends among architectural historians. His interest in and his studies for a monumental biography of Latrobe have long been known. It is, likewise, no surprise that this meticulously documented study should have been selected as the 1956 Pulitzer Prize for Biography and should have been accorded the Alice Davis Hitchcock Medallion of the Society of Architectural Historians. Any way that one looks at it, this is a magnificent work and one destined long to stand at the head of the efforts to delineate the life and professional conduct of this absorbing and original figure.

To be sure, Hamlin has had access to a voluminous corpus of primary material in the letter books, journals, sketchbooks, drawings and paintings of the architect, but the mass of this material is so great that the mere organization of it in anything like chronological order presents a sizeable task in itself. At this task the author has scored a signal victory for, in pursuing the mass of entangled threads that delineate the colorful fabric of the architect's life, the reader experiences little or no difficulty. Moreover, the records of overlapping commissions and involved professional activities are so managed that the story of each enterprise is accurately and clearly related. This is accomplished by a series of "flash backs" or cross references that guide the reader through the interminable mass of documentary material that illuminates the story. In spite of the complexity of the task, four biographies—those of Latrobe as a man, as an architect, as an engineer, and as an artist—emerge crystal clear.

The organization of the book is simplicity itself. Following a prologue, Hamlin divides his narrative into four parts: Latrobe in Europe, Latrobe becomes an American, the Climax Period, the End of the Road. To this is added an Appendix, a list of the major sources, and an exhaustive index.

Hamlin first writes of the background and youth of the future architect who was born on May 1, 1764, at Fulneck in Yorkshire, England, the son of a Moravian schoolmaster and an American-born, English-trained Moravian teacher. The lad was schooled at Niesky, in German Silesia, and at a Moravian seminary at Barby in Saxony. There is a family tradition that this training was followed by study at the University of Leipzig and an enlistment in the army of Frederick the Great, but Hamlin finds no evidence to support the claim. That the youth was on the Continent from 1776 to 1784 is plain; how he spent the years immediately following this schooling is not too clear. What knowledge of continental architecture his works exhibit must have been the result of studies and examination of European buildings the year before he returned home. Judging from his abilities as a linguist, he must have spent much time studying language.

By mid-summer of 1784, Latrobe was back in London and presently at work as a clerk at the Stamp Office. Just how long he remained there is not quite clear, but family tradition indicates that he spent some time studying with the able engineer, John Smeaton. No record of this relationship is available, but it could not have been long for we soon find him a trusted employee in the office of S. P. Cockerell, the architect. His work on the Admiralty Building, Whitehall, (1787–88) helps date his association with Cockerell. In 1790 he married Lydia Sellon, daughter of William Sellon, a lady three years his senior. But wedded bliss was to be short-lived for Lydia died in childbirth in November, 1793. Meanwhile, in 1791, Latrobe had opened his own office and attracted several alteration jobs and at least two independent commissions—Ashdown House and Hammerwood Lodge—which Hamlin illustrates and evaluates. These tasks, along with some work as Surveyor of the Police Offices and employment on the Chelmsford Canal, round out his professional work in England.

With commissions falling off, and still deep in grief over the passing of his wife, the architect turned his attention to America, and in November, 1795, set sail for his future home. The voyage consumed fifteen weeks and it was March, 1796, before his ship landed at Norfolk, Virginia. His Virginia diaries are fairly full and one is astonished at the speed with which he made contacts with important people, among them Washington and Jefferson.

The architect's first American commission was the William Pennock house in Norfolk, a rather original design featuring an elaborate staircase hall. Another house of the period was the Colonel John Harvie house (Gamble Hill) in Richmond, brilliantly designed and recalling the typical Maryland estate plan. These projects, Hamlin analyzes in detail, noting the architect's ability to design for the American scene. Latrobe's last important Virginia commission was the penitentiary in Richmond which was awarded as the result of a competition (1797). Latrobe was interested in humane penal treatment and embodied many of his ideas in the structure which was wholly or partially in use for a century and was examined by Demetz and Blouet, French government observers who studied American

prisons in 1835. For his work, Latrobe asked a fee of five per cent but he was never able to secure full payment for his services. Hamlin's full treatment of Latrobe's Virginia experiences is most valuable, giving as he does, fine side-lights upon the contemporary scene in the Old Dominion.

During his Virginia sojourn, Latrobe had a growing conviction that Philadelphia, then the nation's capital and cultural center, should offer a London architect better opportunities than tidewater Virginia. Moreover, he had family connections there and owned some Pennsylvania property. He carried with him letters of introduction, one of them to Samuel M. Fox, president of the Bank of Pennsylvania, who was at the time occupied with the business of erecting a suitable banking house. Latrobe made a rapid sketch of what he believed to be appropriate. It was six months later that the bank adopted his plans and appointed him architect. The resultant structure was a gem of a building and the first notable example of the Greek Revival architecture on our shores.

As architect of this monumental building, Latrobe received many professional commissions, social recognition, and election to membership in the American Philosophical Society. Hamlin brings order out of the mass of data having to do with Latrobe's employment as engineer in charge of the design and erection of the Philadelphia Waterworks. This commission associated Latrobe with Nicholas Roosevelt, the inventor and promoter who was then the nation's leading steam engine builder and later to be Latrobe's son-in-law. The experience with the waterworks was for the architect a disastrous one financially.

In 1800 Latrobe remarried, this time to Mary Elizabeth Hazlehurst, a woman endowed with qualities designed to complement those of the groom. The years between his marriage and his removal to Washington, as Hamlin notes, "were strangely compounded of professional success and financial failure," the details of which the author sets forth. But during this period, Latrobe's reputation spread abroad and we find him entering a competition for the City Hall in New York, making alterations at the Chestnut Street Theater, Philadelphia, rebuilding Nassau Hall at Princeton, and designing structures for Dickinson College, and the Medical School of the University of Pennsylvania. A most important project originating during this period (1804) was the Roman Catholic Cathedral in Baltimore. For this structure Latrobe furnished two designs, one in Gothic, one in Classic; the building committee selected the latter.

Of course, most important of all were Latrobe's labors for the Federal government. Hamlin points out that from 1802 until "the end of his life there were only four years (1813–15 and 1818–20) during which he had no Federal commission." These labors ranged from fortifications and dry-docks to the national Capitol. Hamlin reminds us that "an extensive literature . . . deals with the building of the Capitol." These sources, he has used to the end that an admirable summation of all pertinent information is organized into two chapters. The ordering of this was, in itself, a tremendous task and one that places his readers greatly in his debt.

Meanwhile, the story of Latrobe's private professional practice is neatly told, after which the author reviews in detail the important Pittsburgh years with their hopes, aims, and sorrows. Then follow chapters on the Baltimore Interlude: 1818, New Orleans: the End, Latrobe as an Artist, and Latrobe as an Engineer.

Although Hamlin is in love with his subject, his admiration for Latrobe's talents does not blind him to the architect's weaknesses: his poor business sense and his financial entanglements, his land speculations, his involvement with Burr, his frequent altercations with builders and difficulties with his apprentices. These shortcomings, along with the architect's admirable qualities and superb talents, are taken into account. The delineation of the status of architecture is of value to those interested in the rise of the profession on our shores. The index fully lists Latrobe's projects, executed and unexecuted. Among the valuable attributes of the book—to this reviewer at least—are the full way in which the author quotes his documents, the way in which the footnotes are presented and the thorough evaluations of the man and his works. This is indeed an architectural biography as it should be written.

REXFORD NEWCOMB
University of Illinois

Emil Kaufmann, *Architecture in the Age of Reason: Baroque and Post-Baroque in England, Italy, and France* (Cambridge: Harvard University Press, 1955), 293 pp., illus. $10.00.

The picture of the eighteenth century that many of us grew up with, a fiddle-brown landscape of Claudesque calm in which the Arts go through their appointed motions under the undisputed and beneficent Rule of Taste, has come to seem less and less satisfying in recent years. The exposure of the covert romanticism in so much that is outwardly classical, the appreciation of the revolutionary nature of the aesthetics of Hume and Burke and of the modernity (in a twentieth-century sense) of those of Laugier and Lodoli, the reassessment of the architecture of Vanbrugh and Hawksmoor and Soane and the rediscovery of Boullée and Ledoux, the recognition of the significance of the movement that culminated in the Picturesque—after all these it is no wonder that we have had to relegate our old friend to the attic.

The mere recital of some of the things that have led to that relegation is enough to remind us how much we already owed to Emil Kaufmann before the appearance of the book now under review: Boullée and Ledoux, Laugier and Lodoli—but for him, these might still be little more than names to most of us. This book greatly increases the debt. Setting out, as he tells us in his preface, to make a detailed investigation of French architecture of the period of Boullée and Ledoux, he found it necessary to extend the field of inquiry to England and Italy, and thus came to write a general study of the supercession of the Baroque tradition by new artistic ideals. The overturning of the Baroque he presents as the result of attacks from without and not (in the manner of the older historians) as a result of internal decay or "loss of standards," while at the same time showing that there were weaknesses in the Baroque system that made its destruction in the long run inevitable.

Neo-Classicism is the name under which the architecture that followed the Baroque generally goes. Kaufmann sedulously avoids its use. It was the new *Gestalt-Ideal*, he emphasizes, rather than anything deriving from the architecture of antiquity, that made this architecture what it was. "New compositional patterns appeared in all designs of the period, whether classicizing features were used or whether the architect applied geometric forms" (p. 188). Whereas "concatenation, integration and gradation were the fundamental principles which made the Renaissance and the Baroque one system in spite of all the differences between the two stages" (p. 12), "the basic principle ruling composition now was the concept of independence" and this found expression in the designs of "the revolutionary architects" in three "principal patterns"—repetition, antithesis, and multiple response (pp. 188–189).

Such, in brief, is the thesis that Kaufmann develops, with the aid of an almost bewildering number of illustrative examples. An important part of it, which will come as no surprise to readers of his earlier works, is the insistence that the difference between the Baroque and Neo-Classicism—for a reviewer need not deny himself the use of so convenient a term—is fundamental in a way that the difference between the Renaissance and the Baroque is not. Here I, for one, cannot follow him: to show that Neo-Classicism differs in certain respects from the Baroque more than the Baroque differs in those respects from the Renaissance is not to prove that there are not other respects in which the Baroque differs from the Renaissance at least as much as Neo-Classicism differs from the Baroque. Even if one accepts Kaufmann's own purely formal criteria as the only valid ones, there is the consideration that what can be expressed in language only as a difference of degree may in a work of art amount to a difference of kind. Similarly—and Kaufmann seems not to appreciate this when he dismisses the notion of a Mannerist style in architecture because "negative symptoms do not constitute a style"—positive qualities in a work of art may be describable in words only in negative terms.

Even while rejecting the term Neo-Classicism, Kaufmann might, some will think, have paused to consider whether the increased knowledge of classical antiquity possessed by the eighteenth century was not a second cause, so to speak, through which the *Gestalt-Ideal* worked its will. It was surely not altogether due to chance that Hawksmoor the revolutionary was also the nearest thing to a

classical revivalist in the Europe of 1710–1720, that Burlington's "staccato" architecture came from the man who acquired and published Palladio's restorations of the Roman *thermae,* that the desire to isolate buildings like pieces of sculpture followed close upon the publication of the temples of Greece. Kaufmann, so far as one can discover, does not agree; indeed, he is impatient with those who pay attention to second causes. Nor, and this is remarkable in a book about the eighteenth century, is there anywhere any suggestion that a classical column could ever have meant anything to anyone, that it ever had "content"; Greek or Roman, Doric or Tuscan, Ionic, Corinthian or Composite, it can be dismissed as a "classicizing feature." In so far as Kaufmann is concerned with principles from which "the attempts of our own time developed . . . in a consistent, though not always obvious, process" (p. 214), it is logical that he should ignore matters of content; for the uniqueness of the most significant architecture of the twentieth century to date has resided in its being a purely visual architecture, without content—the first purely visual architecture in the history of the world. In so far as the book may be read as history, his ignoring of matters of content, and of second causes, is an impoverishment of the theme.

But then of course it is not a history. It is rather a critical work in the tradition of Wölfflin's *Kunstgeschichtliche Grundbegriffe,* which Wölfflin described as an attempt "to set up standards by which the historical transformations . . . can be more exactly defined." Read as such it is an absorbing and stimulating book, while it is safe to prophesy that it contains many things that are destined to become part of the equipment of all future explorers of the period. For instance, the set of three "principal patterns," already listed, is as portable as it is useful; "Frozen Baroque," as a name for one of the earlier and more conservative phases of Neo-Classicism, is also, I suspect, assured of a future. Then many of Kaufmann's critiques of individual designs are extremely perceptive. This is especially the case in Part I; here his subject is English architecture, to which he has not before turned his attention. Hawksmoor and Vanbrugh are given their full due as precursors of the revolution to come; there is a splendid analysis of Seaton Delaval which it is very interesting to compare with Summerson's in *Architecture in Britain 1530–1830.* (They were written quite independently, of course: Kaufmann died before Summerson's book appeared.) What is more surprising, but surely quite just, is that Kent, in his Horse Guards, should be seen as something of a revolutionary, "with all the intransigence of a man who at last has found a new way—a way not leading back to Palladio but forward to our own time—[and who] strove to realize the new concept of antagonistic cubes within the old pattern of a ruling central pavilion and subordinated sides." (Again one remembers a criticism by Summerson, this time in *Georgian London,* much less favorable and concluding that Kent's attitude to design "was that of a decorative painter"—but then was it not Ledoux himself who wrote: *"Vous qui voulez devenir architecte, commencez par devenir peintre!"?*) For Robert Morris, on the other hand, Kaufmann claims too much; Morris's "cubism," as Wittkower has shown, was essentially Palladian. His treatment of Soane brings out the ambiguities and contradictions in his work at the expense of its positive qualities, as indeed any attempt to "place" that great eccentric within any movement (revolutionary or not) is bound to do.

Part II, on Italy, opens with a discussion of "the Renaissance-Baroque system" on which I have already made some comment. The next chapter, on theoretical writing from Alberti to Lodoli, adds to our knowledge and understanding of the disputes between the traditionalists and the functionalists, or "rigorists"—a subject, incidentally, with which Kaufmann first dealt in an important contribution to one of the early issues of the SAH JOURNAL.* Nothing is ventured as to the extent to which the functionalists may have been inspired by English writers, as for instance Berkeley (who was much read in Italy), or Hogarth. There follow chapters on Piranesi and, mainly, Valadier.

Part III, on France, is by far the longest. Not only was France the home of Boullée and Ledoux, certain of whose designs on paper were the nearest thing to abstract architecture before the twentieth century, but it was in France that the new principles appeared most generally and most consistently in the works of men less conscious of a revolutionary purpose. For Boullée and Ledoux, as for Lequeu, we shall still need to turn to *Three Revolutionary Architects.* But here we can see how Peyre and Antoine and Victor Louis and De Wailly and Le Camus and Neufforge and Delafosse and Gondoin, among those of the generation of 1730, and Sobre and Vaudoyer and Normand and Percier and Gisors and Dubut and Durand, among those of the generation of 1760, fit into the new picture.

"See," did I say? Well, perhaps not as often as one would wish. Although Harvard has been as generous in illustrating this book as anyone could fairly ask, to get full value from it, and from Part III in particular, one would need to read it in a first-rate architectural library, so as to be able to look up the scores of other works to which Kaufmann refers. That one should feel this would be worth the labor is some indication of its interest.

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Donald N. Wilber, *Architecture of Islamic Iran, The Il Khānid Period* (Princeton: Princeton University Press, 1955), 208 pp., 217 photographs, 60 figures. $20.00.

This volume is Number 29 of the Princeton Monographs in Art and Archaeology and Number 17 of the Oriental Studies. Dr. Wilber has performed a timely and most useful service in bringing together a record of the remains in Iran of buildings constructed during the predominantly turbulent years of Mongol rule by the descendants of Jenghiz Khan. Part I is devoted to a brief review of the military and political activities of the Mongols, reflecting a usual pattern of invasion, ascendancy and decline, from the departure of Hulagu for the West in 1245 through the disturbances preceding Tamerlane's establishment of domination by 1389. Part II deals with the style of the architectural monuments, including methods and materials of construction and decoration, and features of construction and design. This discussion is admirably documented by photographs, well-chosen and reproduced, and drawings which add immeasurably to the information it has been possible to include in the text. Then follows a catalogue of more than 100 items with exhaustive discussion of details and extensive pertinent bibliographical references. The text concludes with a bibliography from Western and Iranian sources and an index.

In writing of the architecture of the Il Khānid period, the author makes it clear that this is a political rather than stylistic label. He therefore draws heavily on the characteristics of previous types of construction and decoration in Iran, particularly of the Seljuk period, which he describes as a proto-form of Il Khānid style, the latter placing decided emphasis upon verticality and upon refinement of selected forms. This raises the question, periodically debated by historians of Iranian architecture, of a possible analogy between the evolution of Gothic from Romanesque architecture and of Il Khānid from Seljuk architecture, since the two Iranian periods cover approximately the same chronological term of years as those of the Gothic and Romanesque periods in Europe. He concludes that "certain specific features . . . do seem to support such an analogy but, in general, there was not such a revolution in concept and forms as brought Gothic style out of the Romanesque." The material does, in fact, point up the continuity of styles and practices, both before and after this period, the many variations and local preferences or usages resulting from time lags, and the apparent mobility of artists and artisans throughout the Middle East and along the trade routes to China. The material also reflects much individuality and imagination in design and the characteristic Iranian preference for appearance, rather than permanence in construction. It also reflects the traditional Iranian practice of skillful adaptation of foreign methods, styles, and beliefs to enrich and embellish familiar and accepted patterns.

Dr. Wilber deserves much credit for the perseverance, patience and competence with which he handled this exceptionally complicated subject. The monuments are often not readily accessible, are in

* "At an Eighteenth Century Crossroads: Algarotti versus Lodoli," *Journal of the Society of Architectural Historians,* IV, No. 2 (April, 1944), pp. 23–29.

a ruined or repaired condition making examination and reconstruction difficult, and are usually without reliable evidence for dating. The traditional Iranian practice of robbing disused or disintegrating buildings of material for re-use, plus the gradual disappearance of monuments left in isolation by natural disaster or movements of population, have drastically reduced the number of buildings still standing in their recognizable original forms.

The gaps in our information which a survey of this type points up will stimulate controversy. They raise once more the questions of the extent and impact on Iranian architecture of examples in Syria, Asia Minor, and the Oxus region; and of the methods by which specific architectural or decorative forms were selected and executed. Were there paper plans evolved in detail or only concepts in the heads of master builders carried out on the basis of rough sketches? Even if the book served no other purpose publication would be justified, since it provides dissenters, better than other mediums, with specific statements for examination. It should be hoped and may confidently be expected that this stimulus will in time disclose supplemental monuments and supply additional information to contribute further light on this fascinating period of interaction between the cultures of the East and West. This volume should be of particular value to students of Iranian civilization because of the incidental light it throws upon practices and attitudes, quite aside from the discussion of architecture. Not the least interesting feature is that, despite the fighting and violence in political circles, the humdrum process of production appears to have gone on with a gradual reconciliation and adjustment of social and spiritual forces which created in Iran the sources of subsequent brilliant, peculiarly Persian achievements in architecture and other arts.

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BOOKS RECEIVED

(Mention of a book here does not preclude its subsequent review)

J. B. O'Connell, *Church Building and Furnishing* (Notre Dame, Indiana: University of Notre Dame Press, 1955). $5.50.

The American edition of a work first published in Great Britain entitled *The Church's Way*. Either title is somewhat of a misnomer, for the book is really a dictionary of church furniture as used in the Catholic church. It is weak in historical explanation, but strong in definition, so that the designer of a Catholic church might do well to refer to it for guidance in the complexities of liturgical use. Some appended photographs suggest the great variety of arrangement possible under the strict rules and tradition of the Church.

John Finley Oglevee (ed.), *Letters of the Archbishop-Elector Joseph Clemens of Cologne to Robert de Cotte (1712–1720)* (Bowling Green, Ohio: Bowling Green State University, 1956). $5.00.

Robert T. Paine and Alexander Soper, *The Art and Architecture of Japan* (Baltimore: Penguin Books, 1955). $8.50.

Record Houses of 1956 (New York: Dodge Books, 1956). $2.95.

Henry L. Savage (ed.), *Nassau Hall* (Princeton: Princeton University, 1956). $3.75.

Vincent J. Scully, Jr., *The Shingle Style: Architectural Theory and Design from Richardson to the Origins of Wright* (New Haven: Yale University Press, 1955). $6.50.

Eduard Sekler, *Wren and his Place in European Architecture* (New York: Macmillan Co., 1956). $12.00.

Laurence Sickman and Alexander Soper, *The Art and Architecture of China* (Baltimore: Penguin Books, 1956). $8.50.

E. Baldwin Smith, *Architectural Symbolism of Imperial Rome and the Middle Ages* (Princeton: Princeton University Press, 1956). $7.50.

John Betjeman, *The English Town in the Last Hundred Years* (Cambridge: Cambridge University Press, 1956). $0.75.

The Rede Lecture, being a special plea for man to preserve his architectural heritage for himself and posterity. Mr. Betjeman is speaking primarily to the English public, but his observations clearly apply to the American scene as well where scenic settings for old houses, and avenues lined with aged oaks disappear daily, making way in the name of progress for bigger billboards and faster vehicles.

Paul Damaz, *Art in European Architecture* (New York: Reinhold Pub. Corp., 1956). $12.50.

A very striking collection of photographs of the most recent European architecture in which artist and architect have collaborated successfully. Le Corbusier, in the introduction, says that a synthesis of the arts is only too rarely made, but the author has attempted to deny this by his broad and careful selection.

J. Quentin Hughes, *The Building of Malta* (London: Alec Tiranti Ltd., 1956). 42s.

Clay Lancaster, *Back Streets and Pine Trees: The Work of John McMurtry, Nineteenth Century Architect-Builder of Kentucky* (Lexington, Ky.: Bur Press, 1956). $7.50.

Pierre Lavedan, *French Architecture* (Baltimore: Penguin Books, 1956). $0.95.

This is a translation from the French of a book first published in 1944. The unknown translator has unfortunately contrived more than one awkward phrase. However, English readers will be glad to have M. Lavedan's interesting survey readily available, with its generous selection of plates. Although the book purports to be a "complete survey . . . from the Middle Ages until to-day," there is a very noticeable lack of twentieth-century examples.

R. D. Martienssen, *The Idea of Space in Greek Architecture* (Johannesburg: Witwatersrand University Press, 1956). 32s. 6d.

Dorothy and Richard Pratt, *A Guide to Early American Homes—North* (New York: McGraw-Hill, 1956). $6.95.

Dorothy and Richard Pratt, *A Guide to Early American Homes—South* (New York: McGraw-Hill, 1956). $6.95.

SAH NEWS

THE ANNUAL MEETING

The annual meeting of the Society will be held on January 24–27, 1957, at Detroit, Michigan. The sessions will be held jointly with those of the College Art Association. Announcements have been sent to the members.

TALBOT FAULKNER HAMLIN
1889—1956

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